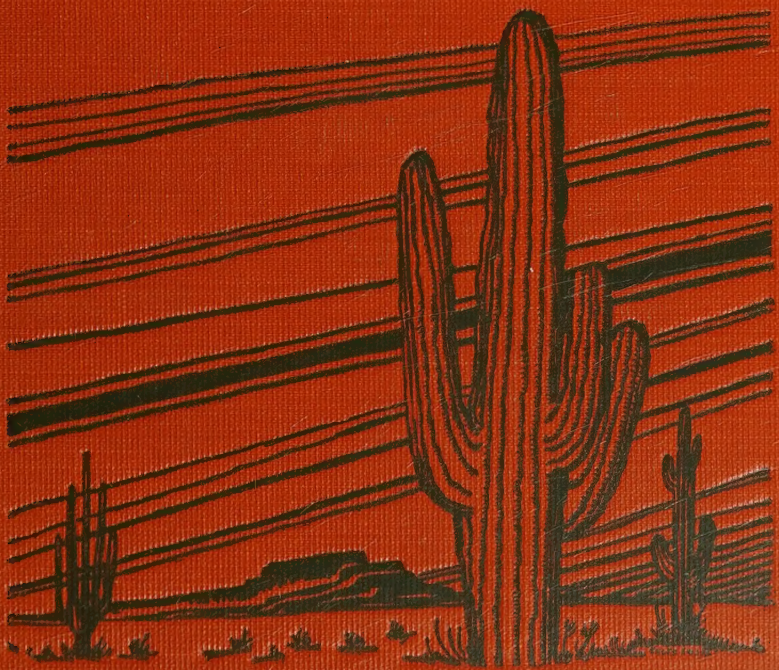
ALLURING ARIZONA

WILLIAM HAMILTON NELSON



Property of
Boerne Public Library

917.91 [redacted]

Nelson, William Hamilton

Alluring Arizona

Withdrawn

NOV

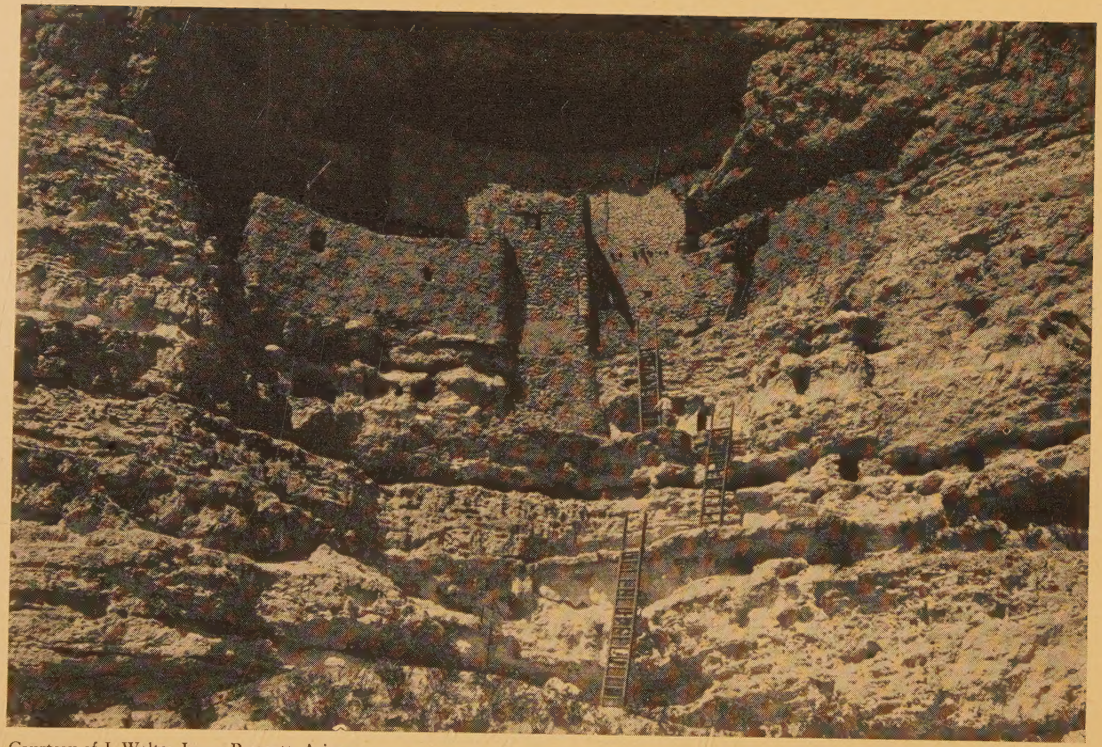
Withdrawn

ALLURING ARIZONA

WILLIAM H. NELSON

Digitized by the Internet Archive
in 2026

https://archive.org/details/alluringarizona0000will



Courtesy of J. Walter Jones, Prescott, Arizona.

MONTEZUMA'S CASTLE AND ANCIENT CLIFF DWELLING, NEAR PRESCOTT, ARIZONA.

ALLURING ARIZONA

BY

WILLIAM HAMILTON NELSON

BEING A SERIES OF CONNECTED SKETCHES OF THE YOUNGEST STATE IN THE AMERICAN UNION, AND THE OLDEST IN THE WORLD.
BEGINNING WITH THE PRIMITIVE INHABITANTS, THE CLIFF DWELLERS, TELLING OF THE COMING OF THE SPANISH EXPLORERS; THE DISCOVERY OF THE GRAND CANYON; THE DESCRIPTION OF IT. A DESCRIPTION OF THE PETRIFIED FORESTS; PAINTED DESERT; THE INDIAN PETROGLYPHS, OR PICTURE WRITING; SOMETHING ABOUT HOPI INDIAN ARCHITECTURE, AND THE HOPI SNAKE DANCE; THEN THE STORY OF THE APACHE TRAIL AND FINALLY,

ARIZONA TO-DAY

PRESENTING A PAGEANT OF PROGRESS, AND PAINTING A PICTURE OF ARIZONA FROM THE MYSTIC PAST TO NOW.

1927
WILLIAM HAMILTON NELSON
307 PACIFIC BUILDING
SAN FRANCISCO, CALIFORNIA

COPYRIGHT, 1927, BY
WILLIAM HAMILTON NELSON,
307 Pacific Bldg., San Francisco, Calif.
(Send orders to above address)

Cover design by Mr. Ralph Chessé, San Francisco.

MANUFACTURED COMPLETE BY THE
KINGSPORT PRESS
KINGSPORT, TENNESSEE
United States of America

With Much Appreciation
This Volume Is Respectfully
Dedicated
to
MR. JAMES B. DUFFY
of Los Angeles, California
Who Has an Eye to See the
Natural Beauty and the Material
Resources of Arizona,
Who Inspired and
Encouraged Me to Write.
The Author.

CONTENTS

CHAPTER		PAGE
	Author's Preface	xi
I	Casa Grande, and the Prehistoric Dwellings in Southern Arizona	1
II	The Cliff Dwellers, in Montezuma's Castle, near Prescott, Arizona	7
III	Spanish Explorations in Arizona	29
IV	Grand Canyon of the Colorado, in Arizona.	39
V	The Painted Desert of Arizona	47
VI	The Petrified Forests of Arizona . . .	57
VII	Indian Picture Writing	73
VIII	Hopi Indian Architecture—and Else . .	81
IX	The Hopi Indian Snake Dance	89
X	The Apache Trail	99
XI	Arizona To-Day	117

LIST OF ILLUSTRATIONS

Montezuma's Castle, Ancient Cliff Dwelling, near Prescott, Arizona . . . . . *Frontis.*

Mission San Xavier, del Bac, near Tucson . . . 36

Grand Canyon, Arizona, near Mariposa Point . 42

Fantastic Shapes, Painted Desert 52

Trees in Petrified Forest 64

Petroglyphs, or Indian Picture Writing . . . 76

The Hopi House, Grand Canyon 82

Hopi Snake Dance, Showing Rattlesnake in Priest's Mouth 94

Superstition Mountain, on Road to Apache Trail, and Roosevelt Dam 104

The Roosevelt Dam 124

PREFACE

Many introductions are like the sermon method of a colored preacher. He said, "I tells 'em what Ise gwine to tell 'em; next I tells 'em; den I tells 'em what I told 'em."

We save you all this repetition: we simply tell you and leave it with you. However, a word of explanation is necessary. This book deals with the State of Arizona only. Do not regard it as a series of disconnected sketches. It is a connected whole, beginning with prehistoric man in the cliffs of Northern Arizona, and on the desert in Southern Arizona. It then takes up the coming of the first white man, the Spanish missionaries, and the Conquistadores, which led to the discovery of the Grand Canyon. The other scenic wonders are then given you to enjoy, and we swing into the Apache Trail, the work of modern man at Roosevelt Dam, and give you a glimpse of the Arizona of to-day. The only thing omitted is the coming of the Americans, and for a very obvious reason—it would take a book twice this big to do it justice.

A person with the requisite gift could make the book the basis of a spectacular pageant—a scenario, in fact.

Another word: We are neither a scientist nor the son of a scientist; we are but a plain layman in love with Nature, seeking to interpret Nature to the average man. Josh Billings said that the difference between a scientific lecture and a humorous one was that you had to understand the latter to enjoy it. A great many people profess to enjoy a scientific treatise, but the truth is we know that it is plagued hard reading, and we don't get it. Personally we are familiar with the scientific aspect of some of the subjects discussed. We have good authority for everything we set down in our book, having thoroughly searched the Smithsonian and Government publications.

But we did not write this book for scientists: we wrote it for the great mass of common people, one of whom we

are which—the people that the Lord must have loved, for He made so many of them. They are our folks, and we are interested in seeing that they get the best; hence this book.

We want you to stand beside us as we view the sublime spectacles herein depicted. And we want to do something different; we want to transfer to you the emotions we felt while beholding them; and very frankly we want to stir up in your soul a love for the beautiful and the sublime in Nature, until you, too, will want to hold communion with Nature in her visible forms, until the eyes of your understanding are enlightened and lifted up, and you literally dwell in a new heaven and a new earth. If we can awaken in you a finer appreciation of earth's wondrous beauties, an appreciation that transforms your life, brings you into closer fellowship with Nature, brings new and added joy to the remaining days of your allotted years, we shall feel well repaid for our effort. We crave for you an original relation to the universe, for we go through this world seeing beautiful things, yet not knowing what they are all about.

Just this word to the hypercritical. We decided that you could not actually visualize the greatness of Arizona without telling you something of the wonderful resources of the State, so we wrote the last chapter in the book, "Arizona To-day." The resources of this State are so many and varied that we naturally overlooked some things, and gave others just an impressionistic touch. If you are tempted to say, "Aha, he missed that," please remember that we are writing a book of description, and not a set of encyclopedias—for it would take that to tell it all.

We stumbled into this book by accident, not by design. As an editor we wrote and published in our own paper most of these sketches. People who read them said they were not as bad as they might have been, and we were importuned to put them in permanent form—this before the book was half written. And incidentally we discovered the secret of successful authorship—sell your book first, write it afterwards. More than 1,100 advance orders were received before the publishers stuck a line of type;

so, many folks—foolishly or otherwise—evidently thought it was good.

Mahomet said, "If I had two loaves of bread, I would sell one of them and buy white hyacinths to feed my soul." Man does not live by bread alone; so, surprise your cerebrum, give your cortex a rare treat, and increase your intellectual and æsthetic red corpuscles by reading this book.

The Author.

CHAPTER I

Casa Grande, and the Prehistoric Dwellings in Southern Arizona

WHILE the limestone and volcanic tufa cliffs of Northern Arizona were in places, like Beaver Creek, honeycombed with cliff dwellings, the Salt River, the Gila, and the Santa Cruz valleys of Southern Arizona contained thousands of prehistoric people. Evidence of this lies on every hand: At Casa Grande, the City of the Dead at Chandler, Casa Blanca, Snaketown, the Mesa, and Cross Cut Ruins. Hammers, hatchets, shovels, hoes, axes, arrowheads, all made of stone; jewelry in the shape of stone and shell beads, shell bracelets, amulets, bone awls, cotton cloth, yucca fiber, squash seed, beans, cotton seed—all have been found, but no implements of metal, showing they lived before that age; the big adobe and caliche house found separately, and even little cities scattered thickly over the valleys, some of them buried for ages beneath the sands of the desert as completely as some of the tombs and monuments of ancient Egypt were covered. Moreover, several irrigation systems have been uncovered, many of them large enough to support an enormous population.

Ancient Irrigation Canals

In the Salt River Valley were found 150 miles of main irrigation canals, capable of supporting a population of nearly a quarter of a million. The Casa Grande irrigation system, whose waters were drawn from the near-by Gila River, had canals capable of affording support to a hundred thousand people. There are five distinct series of ditches in the three-mile stretch between the Gila River

and the Casa Grande, numbering altogether many miles. They evidently dug the ditches with flat "digging stones," for hundreds of these have been found in the locality. What a man-size job it must have been! Smaller systems were found in other places in Southern Arizona. It is worthy of note that American pioneers in Arizona when they first came to the country used many of these ancient canals. When new canals were planned the engineers said that these prehistoric waterways were not at the right level, but more recently, after years of experience and much trouble, they have ascertained that these prehistoric ditches were in proper line and level. It is reported that even to-day, on a certain Indian reservation in Arizona, when the superintendent wants to supply water to a new section of land he does not consult an engineer, but one of the older Indian farmers. He explains to him what he wants done and shows him the layout. If the Indian says he can do it, it is done under his direction. He can't tell how he does it; he simply does it.

The Ruins at Casa Grande

One of the most interesting of these prehistoric desert dwellings in Southern Arizona is the ruins at Casa Grande, about ninety miles west of Tucson, near the main line of the Southern Pacific Railway. Just as the first settlements in Assyria and Babylonia were built near the river, even so did these primitive people put water for irrigation as their first concern. Thus did those who built the Casa Grande, or Great House, which Padre Eusebio Kino, missionary to the Indians of this region, first found in 1694 as a burned-out and dismantled group of walls. He said in his memoirs that at that time the Casa Grande was a four-story building as large as a castle, and equal to the finest church in Sonora. Near-by were thirteen smaller houses, somewhat more dilapidated, also the ruins of many others. From what he learned at that time there were other houses farther to the West, North, and South, and ruins of whole cities, with many broken metates (or slabs on which they ground corn), jars, charcoal, and other remains.

A Monumental Work

Mr. Frank Pinkley, the efficient and courteous custodian of the Casa Grande monument, thinks that the improvement in wall construction shown at Casa Grande must date back at least five hundred years. This building, which has been abandoned for at least five hundred years, was built primarily as a watch-tower, and was the tallest building in a cluster of houses which covered about three acres. It was surrounded by a wall 418 feet long on the east and west sides, and 225 feet on the north and south, resembling a walled village of mediæval Europe. This watch-tower building is 40x60 feet, and while the outside tier of rooms was only three stories high, the inside tier was four stories. Another remarkable thing about it is that the first story was filled up, probably to strengthen the walls, and the outside walls were thicker at the base than at the top. This watch-tower enabled them to see a distance of ten miles of this flat country. The rooms numbered sixteen, the smallest being 10x24 feet. There were eleven living rooms, and one or more families lived in each room. Articles of furniture were few. The entire building was built of adobe with walls four feet thick, and the character of the soil indicates that they were sunk below the surface at least four feet. There was no domesticated draft stock of any kind to carry burdens, and the inference is that all building material was carried on the backs of the builders. It has been estimated that it took fourteen hundred back-loads of mud, one hundred and ten pounds to the load, to raise the wall one foot. When we think of these walls in three or four large buildings scattered over a three-acre enclosure we can understand just about how long it took these people to do this work. Furthermore, we have to reckon with the fact that this particular building was done in spare time—they had to raise their crops first—just as hard-pressed farmers to-day will put up an outbuilding in odd hours.

The ceilings were artfully made. The wood for the rafters—juniper and cedar—grew from sixty to seventy miles away, and all bear internal evidence of having been

cut with a blunt instrument. Stone hatchets are numerous in the ruins. The felled timbers were rafted down the Gila River into the irrigation canal which led to the village. The giant poles which form the roof seem to average five inches in diameter, and were placed about six inches apart. On top of these the ribs of the giant sahuaro cactus were placed transversely; and transversely on top of these again was placed an abundance of another desert plant, the arrow weed, and the whole surmounted with a layer of six to eight inches of mud. The doors inside were but eighteen inches wide and thirty-six inches high, making it necessary for the dwellers to muchly reduce, and for invaders to pause in their mad onrush.

The Art Instinct Early Developed

One of the interesting inscriptions on the walls which is still discernible is an eight-passage labyrinth. This is the only place on the American continent where this occurs. It was used in Crete two thousand years ago, and duplications of it are found in Germany and the Balkan States. This furnishes an interesting theme for speculation as to the connection between the Old World and the New. Who brought over this picture of the labyrinth in his brain and recorded it here?

That some of these Indians had the artistic impulse is beyond doubt. A museum on the grounds contains an interesting collection showing the varied activities of their tribal life. They developed three-color pottery—old red first, then white, and then black. There is an old olla, or water jar, capable of holding thirty-nine gallons, made by hand, and showing high artistic skill. There are baskets which show splendid work. The pottery reveals occasionally a real artist at work. Greek designs are used freely, and perfectly too, although there are some intentional deviations from the design, the idea being not to make the work perfect lest the gods be displeased.

Cremation was undoubtedly practiced, as cinerary urns containing charred human bones are frequently found. These Indians went hundreds of miles to the Gulf of Cali-

fornia, or to the Pacific Ocean, to get shells to make bracelets. These they rubbed on rock until worn down to the required size and shape. Beads were found perforated with holes so small that the piercing instrument used is still a mystery. Some of them are finer than a needle point.

Device for Astronomical Reckoning

An interesting thing was the discovery of two holes about one inch and a half in diameter extending through the thick surface of an outer and a corresponding inner wall, separated by a small passageway. These holes had a bearing of eighty-five degrees east. By this they measured their calendar year, for the sun rising in the horizon from year to year does not vary at a certain point. At a certain time of the morning of March 7th and the morning of October 7th the sunlight shines straight through the outer hole for three minutes, and strikes within a quarter of an inch of the inner. At first it probably went through both, but the present slight deflection is doubtless due to the settling of the building. We believe these primitive people had an accurate way of measuring time, even before some of the now-advanced people were able to make up a correct calendar.

Around this main compound are the ruins of many other small houses, most of them one story, although several have two stories, while a group in one corner has three stories. There is another set of buildings in what is called "Compound B," where the architecture is different—terraces, on which houses of a flimsy type were put up. East of the Casa Grande there is a Clan House—a series of rooms ranged around an open plaza. One object in this house is believed to be an altar. This is quite possible, as many ceremonial objects, prayer sticks, etc., have been unearthed.

A Vanished People

What became of these people? The Pima Indians who occupied this section called them the "Hohokam," or "Vanished People." Is this where we get the word "hokem"? They give them a semi-mythical air, saying they were half human and half celestial, the union of a

heavenly being with a beautiful mountain woman, whose leader, Chief Morning Glow, was the head of the tribe. Others believe they were a peaceful people who were attacked by savage tribes, who burned much of the woodwork in the houses, drove the occupants out, and adopted a dog-in-the-manger attitude, not occupying the house themselves. Conjecture is that these people then went to the north, and, profiting by their disastrous experience on the desert, built Montezuma's Castle up in the cliffs, and finally joined the Waterhouse Clan of the Hopis, which has certain legends fitting into this theory—a theory we give for what it is worth; to date nothing has been conclusively proved.

Some years ago the Government took over this structure, put a roof over it, and appointed a custodian. This custodian has done much excavating roundabout, and has conserved a wonderful collection of artifacts, creating a most interesting museum right on the ground. If you would get in touch with primitive life in Western America, and so infuse a new appreciation in your artistic soul, don't fail to visit this Great House, which may have been the "White House" where dwelt the ruler of all that region in ye olden time.

CHAPTER II

The Cliff Dwellers, in Montezuma's Castle, Near Prescott, Arizona

DID you ever want to do something all your life, and then get to the place where you were able to do it? That happened to us recently. For years we felt that life would be as flat, stale, and unprofitable as a nomination for the presidency by the third party if we did not get to see a cliff dwelling before we died—and here we are getting on in years, and not one cliff dwelling in sight. So, when we went to Prescott, Arizona, last spring a government scientist interested in ethnology told us that the cliff dwellings on Beaver Creek, called "Montezuma's Castle," were the most accessible in the United States. Prescott is only fifty-five miles from the dwellings, and there is an amazingly fine road all the way.

Why Should a Man Be Interested in Cliff Dwellings?

Simply because the first dwellings of man everywhere were in the cliffs. Where did the first man appear? Where was the Garden of Eden? That is a question which is full of talk, and something that you can raise an argument on any day in the week, and not half try. Some folks don't care where you place it as long as it is in California, or Texas, or wherever they happen to live. However, there is little doubt that it must have been in the chalk, or limestone belt, which extends practically all over the world. The chalk belt may be traced from the north of Ireland to the Crimea, in Southern Russia, and in an opposite direction from the south of Sweden to Bordeaux, France, eight hundred and forty miles. It extends in a broad belt across France, through Central Europe, and on to North Africa. In another direction it stretches from the Crimea into Syria, and

may be traced as far as the shores of the Sea of Aral in Central Asia. But before the chalk formation was tossed aloft there had been an earlier eruption from the depths of the ocean, the Jurassic limestone built up by coral insects.

The Besetments of Primitive Man

It was Plato who said that man was a biped without feathers. Not only did he lack feathers, but he lacked any form of natural protection from the rigors of the elements, especially in the inclement winter season. Several things made primitive man a cliff dweller. In the first place, while he found himself on the floor of the valley, there were times when he needed protection from predatory beasts. Living in the limestone belt where the rains had a habit of periodically washing out the sides of the mountains, beneficent nature began to excavate his cliff for him. It was easy for him to take the crude stone implements which he had devised for protection against ravening beasts and dig still further into the rock. This happened all over the world. Sabine Baring Gould, best known for his hymn, "Onward, Christian Soldiers," some years ago wrote a most delightful and entertaining book called "Cliff Castles and Cave Dwellings of Europe." He showed convincingly that the first dwellings of man all over the Old World were in the cliffs. In Asia these rock dwellings abound. Those acquainted with the geography of Palestine know that the Holy Land is riddled with them; it is a limestone country. Cliff dwellings are found also in Armenia, and Afghanistan. In the latter country, at Bamin, the rocks are perforated in every direction with former dwellings, where a whole people were put up in twelve thousand galleries occupying the slopes of the valley for a distance of eight miles. Isolated bluffs are pierced with so many chambers that they look like a honeycomb. In Arabia Petræa a highly civilized people converted their simple rock dwellings into sumptuous palaces. So you see what wide latitude there is for placing the Garden of Eden in the Old World—and also in the New.

A Noted Geologist's Observations

In 1850 the then Secretary of War for the United States

published an account of cliff dwellings in Colorado. Of course up to that time anything west of the Rocky Mountains—indeed, anything west of the Mississippi River—was practically unknown. People east of the river lived in blissful ignorance of a wonderful world on the west, a world hoary with antiquity even before Columbus conceived his epochal voyage westward, or before Lief Erickson or other Norse explorers were born. 'Way back in the day-dawn of time the Pueblo Indians dwelt near the Rio Grande on the adjacent cliffs, and the Zunis in the red sandstone cliffs bordering the Gila. In the Pueblo country tremendous canyons of red sandstone abound, and in their slopes the habitations of human beings perched on every ledge in almost inaccessible situations. Major Powell, United States geologist, years ago, in traveling this western country, expressed amazement at seeing nothing for whole days but perpendicular cliffs everywhere riddled with human dwellings, resembling, to him, the cells of honeycomb. The heights were scaled by means of long poles with ladder-like rungs, and inserted at intervals in notches set into the face of the perpendicular rock. Thus it will be seen that there was a marked resemblance noted by Major Powell in the various cliff dwellings of the West, for they are found only in Colorado, Utah, New Mexico, and Arizona, and the cliff dwellings of the Old World.

In order to understand these mysterious people, whose origin goes back into antiquity, we are asking at the outset two questions: Who were they, and where did they come from? Where did they go?

Who Were the Cliff Dwellers?

Opinions differ even among ethnologists regarding a proper classification. One view is that the term refers only to the former occupants of the houses in the cliffs of Arizona, New Mexico, Colorado, and Utah. Others say that it refers to the prehistoric Indians of the Southwest, and includes three groups: (1) The earliest cave dwellers who occupied these natural recesses in the friable limestone cliffs of the Southwest, and who did only the crudest kind of

work to enlarge their quarters, adding to them merely by excavating pithouses in the cave floor, and who protected their restricted single entrances in the most primitive way only with wood and bark; (2) The people who built for themselves more elaborate and numerous rooms in the limestone cliffs, digging out the sides, supplementing with masonry work, building several stories; (3) The people who built extensive villages in the bottom of the canyons or out on the desert, as at Casa Grande. But, in our humble judgment, the term should be applied to those only who built houses in the cliffs. This would distinguish them from the cave dwellers on the one hand, and the stone-house builders and desert dwellers on the other.

Who Were the Cliff Dwellers Racially?

Since writing on the Indians of the Southwest—and I do not claim to be an expert; I am neither a scientist, nor the son of a scientist, but merely a highly interested layman who is enthralled with the subject—I have received all kinds of advice—unsolicited. Some folks have written in that the cliff dwellers were the ten lost tribes of Israel, and they assure me that they have all kinds of data to back up their contention. Others side with Ignatius Donnelly, that they were the people of the "lost Atlantis." Others are sure they came from Egypt, and still others from Japan. And so on, world without end. This cured me of believing that there was any lack of interest in the origin of these peoples.

Where Did They Come From?

The people who argue for an Egyptian origin cite a supposed identity of, or similarity in, some burial customs, in picture writing, and in religious ceremonials. A good deal of this resemblance is more fancied than real. It is our belief that these people came up from Mexico, for similar cliff dwellings have been found in the Piedres Verdes, Chihuahua, Mexico. Also, dwellings resembling these have been found in the State of Jalisco. The contention that these cliff dwellers came up from Mexico is founded not only on similarity of structure, but on some of the artifacts

found in the ruins; for example, a Mayan bell, Toltec inscriptions on the rocks, and Aztec images. Furthermore, there was a striking similarity in agricultural products—cotton, corn, and beans.

A Visit to Montezuma's Castle

With this knowledge before us, is it any wonder that we were thrilled as we started out from Prescott with our good friend, C. F. York, to visit Montezuma's Castle? What a wonderful, typical Arizona morning it was! Whenever we start out in the mystic morning on such a trip, even though it be in a meek and lowly Ford, it is part of our ritual as we sniff the morning air and draw in several lungfuls, to murmur those lines that Walt Whitman wrote about the open road. You will recall them. They begin something likes this: "Joyful and free I take the open road; hence I ask not good fortune, for I, myself, am good fortune," and so on. We were over five thousand feet above sea level; we had a good road under us, the most marvelous mountain scenery before us, and you may be sure we felt as if we were sitting on top of the world—which we were nearly—up over a mile high. "We are going to see the cliff dwellings; we are going to see the cliff dwellings!" our heart kept repeating. The rarefied mountain air was like an œnanthic of strong wine, and the blood went "sky-hooting" through the veins and singing like the fabled harp of Memnon, which, as you remember, sang glad tunes in the Egyptian Desert at sunrise, and which, by the way, was the original radio (this is our own discovery). Talk about getting a kick out of life—well, wealth and fame may miss us, but we will never forget that ride over the Black Canyon road headed toward the cliff dwellings.

How to Get There

We reached Camp Verde about 10:30, and there took on a local guide, Mr. J. E. Walbeck. Those who have read Captain Charles King's story of early army life in Arizona, "The Colonel's Daughter," will remember that Camp Verde is an old army post. Two of the buildings are there still. This was an important strategic post in the Apache

Property of
Boerne Public Library

war, and furnished plenty of action—action surpassing any moving picture you ever saw or heard of. The buildings are three miles away, and our guide knew just how to get there. As we bowled along the well-made road through this picturesque country of towering mountains, pleasant valleys, and emerald-hued trees, we rounded the mountain, and while more than a mile west we caught our first flash of the dwellings. It was a thrill. The buildings themselves seemed to stand out from the surrounding cliff, having a pink shade contrasting with the white limestone surroundings like apple blossoms in a frame of ivory. In the early days it was sadly out of the way, but now it is the most accessible and one of the finest specimens of a cliff fortress in the United States.

The Apartment-House an Ancient Device

We could not get to the fortress quick enough, though we were going as fast as the law allows. It was a thrill. Finally we came around a corner of the limestone mountain, and, presto! there they were, as big as life and twice as natural. Below us was Beaver Creek, a gurgling, winding stream of water, flanked by cottonwoods, and watering a pleasant valley. Above us, high on the face of a sheer limestone cliff, were the cliff dwellings, five stories of them, and straight up as the brick falls, and from the bottom of the first story to the base of the cliff, a drop of forty feet. Of course, the United States Government is now furnishing ladders for all who have nothing the matter with their hearts. Did we climb? It only took us a minute to decide it, and we were going up that ladder like an athlete. The dwellings run about thirty-five feet and are five stories in height. Latter-day folks think an apartment-house is ultra-modern and an indubitable evidence of present-day smartness. Piffle! Here is an apartment-house put up long before Columbus ever hard-boiled an egg to make it stand on its own bottom. And it was an apartment-house that was sufficient unto itself—it "had everything." We are to-day building combination hotels and churches in New York and Chicago, and think we are doing something new. This ancient apartment-house had a church: there never was a

cliff dwelling found that did not have a kiva, or ceremonial room of some kind, and so it was here. It even supported its own graveyard in the underground cists. You could get married, live, and get buried without leaving home. It was also a storehouse, a warehouse, a social club, and a restaurant.

A Fortress as Well as a Dwelling

We visualized the situation in the early days. The cliff dwellers farmed on Beaver Creek, in the wonderfully fertile land which lies in the creek bottom. When they gathered their crops in the fall they stored most of them in various parts of their five-story dwelling. When the snows came they pulled in the ladders. Of course, they did this also every night to guard against surprise attacks, and they always kept them up in time of trouble, with a lookout on the upper story. What chance, we ask you, would a hostile enemy have climbing up this forty feet of straight-up-and-down cliff to get into that house, especially when a husky Indian with a stone hammer stood at the entrance of the first floor doorway awaiting him as a reception committee? No one but a human fly could negotiate that climb, and no one but a man with a head as thick as a freshman's could feel good and be ready for business after getting hit with a fifteen-pound hammer.

We went through all the five stories, going by ladder all the way, and the ladders are on the outside in every instance. Every floor put us more and more in mind of a modern apartment, for there were always a series of rooms leading into each other. Some of the rooms are not over five feet high, and, judging from this and the narrow doorways (not over four feet high and two and a half feet wide), led some people to jump to the conclusion that these cliff dwellers were all small people. This is a mistake. They were probably of average size. But when you consider that they had to dig these dwellings out of the limestone (and what they stood on while they were doing it we do not know), you will not wonder that they did no more work than they had to. As far as the small doors are concerned, these were used for the following reasons: They prevented

a mass attack on the outside; they could easily roll a stone against the doorway to keep out intruders in the shape of hostile foes or wild animals; and they could keep out the cold.

Structural Peculiarities

The rooms in the castle run well over a score, large and small, and new rooms are being found as they excavate. As is the case at Casa Grande ingenious flooring had been laid—large sycamore trunks eight inches in diameter, and cut with a stone ax, with small twigs laid transversely, and adobe on top. They attempted to build an extension of rooms on the third story, and did a job which lasted for hundreds of years. But these rooms, not having the protection of the overhanging cliff, were weakened by the storms of years, and the flooring has broken through. We noted that the outside wall of the extension was built of rough-hewn limestone rock, but so carefully laid and plastered that it was perfectly straight. The government has reënforced these walls recently with cement. We noted with amazement the interior plastering, which was firm and smooth, almost polished, and had evidently been put on with their bare hands. It reminded us of the Mayans of Central America, who used stucco ten thousand years ago, before Babylon was born or the Sphinx spoke. We noted also in many of the rooms little cubby-holes flush with the floor and running up about two feet in the wall and back two feet, which were evidently used to store grain.

How Did They Get Drinking Water?

Evidently from Beaver Creek, and they stored it in large pottery ollas, or bowls. On the upper floor we noted a parapet about four feet high, behind which warriors might hide, and with portholes through which they could observe the enemy below and shoot arrows while enjoying perfect safety themselves. On this upper story also, roofed over by the cliff, was what was probably the communal kitchen, the smoke on the limestone so testifying. This was probably selected because offering a free vent for the escaping smoke.

The architecture of the cliff dwellings, while wonderfully similar throughout the Southwest, had certain characteristics which distinguished it from ordinary dwellings, and was wonderfully correlated to the surroundings, and well adapted to the life the people led.

Architecture Ad Lib.

There are some remarkable things about this castle. The custodian, Mr. Frank Pinkley, believes that there were three distinct eras in building. They started building, naturally, in the back of the cliff, and worked their way out until they hung a room or two with amazing engineering skill over the edge of the cliff, just like a swallow's nest. There are almost as many different styles of architecture as there are large outside rooms. Evidently they must have had a book, "Every Man His Own Architect and Builder," and went to it. It is interesting to think of a house being syndicated in this fashion. The outside walls where they overhang are a study. A noted civil engineer who recently visited the castle stood at the brink of Beaver Creek, which is 81 feet below the foundation of the castle, and looking up at this marvelous wall said, "It isn't there; it can't be; it won't stand." He and the resident assistant custodian, Mr. G. M. Jackson, went up to measure it. It is said that the proper batter for a wall is an inch to the foot. The custodian and the engineer plumbed the wall by dropping a rock on a string at the end of a stick measuring thirty inches. It was thirty feet from the top to the bottom, exactly an inch to the foot. The engineer said that it took the white man a long time to find that out, but the Indians seemed to know it instinctively.

They were the original whitewashers. Talk about calcium chloride covering a multitude of sins; when the Cliff Dwellers cleaned house and wished to remove the smoke and grease from the walls they did not waste any elbow-grease doing it; they simply slapped on a coat of plaster and made white the surface. In one room we counted seven distinct layers of whitewash. Some of the ancients were very handy men about the house. They left evidences of it on the walls. They did their interior decorating with

three fingers, making nice wavy movements, which finger prints also serve a useful purpose in that they destroy the small-people theory; people with fingers that large were no pygmies. Incidentally, skeletons have been found which put to death that theory: they are unusually large; one skeleton, that of a man with a receding forehead, measured six feet two inches, and all the bones showed that he was a large man. In the bony right hand he still clutched arrowheads made of wood, which was the forerunner of flint. At his head was found a bowl four inches deep and nine across of crude workmanship.

A man who early discovered Montezuma's Castle said that when he first went there in 1876 the ground in front near the castle was littered with numerous fragments of beautifully glazed pottery. There were flint and carnelian flakes, weapons, and other remains in considerable quantity, giving proof of either a very large settlement or one that lasted for many years. It must be added that in addition to the cliff dwellings there were cave dwellings near by, and stone houses, and the remains of at least one stone house not a great distance away, built on an elevation overlooking the valley in all directions. Perhaps they were a part of this community.

Why Did They Build These Dwellings?

We stated in our opening that man, taking advantage of the work begun by nature, used these partly dug-out cliffs to escape from the wild beasts. The higher up he would go the safer he would be; and it will be noted in every case that these primitive architects and builders followed the line of least resistance—the cliff dwellings always take the form and dimensions of the platform or ledge from which they rise. Those who came into the Beaver Creek region possibly had other reasons. Here it is possible to live in the summer time in a brush hogan or animal skin tepee; but in the winter—remember, it is over 2,400 feet high, and you will realize that he would have to find a shelter from the snow, which falls a-plenty, and from the howling, sweeping winds of winter. Furthermore, the food supply of an agricultural people is limited to a part of the year,

while his appetite never takes a vacation. Hence, it is necessary for him to put by something to eat where his redskin neighbors, not up on ethics, cannot break through and steal. Further than that, the early Indian was no pacifist, and the only way he could keep his hair from falling out was to get himself up on a mountain-top and see the enemy first.

Storage Houses a Necessity

Undoubtedly the problem of the food supply had something to do with the building of the cliff dwellings. Although these primitive people never heard the phrase, they were, nevertheless, affected by the law of economic determinism. Before people can make any progress they must have leisure, and before people can have leisure they must have a food supply which can be put away and saved. They have to produce in their working time more than they eat, and save a surplus. As long as they lived from hand to mouth, depending on what fish they could catch and what game they could kill, no progress was possible; they had to learn something of agriculture, and they had to know how to utilize everything that nature placed near at hand. A certain man said that the primitive Indian in Arizona got his living out of the desert, and now he is just as bad as the white man in that he simply cannot exist without a can-opener. So, the early cliff dwellings were also storage houses.

A Day in the Life of the Cliff Dwellers

These cliff dwellers who came into the Verde Valley and built what was afterwards called Montezuma's Castle certainly had an eye for the beautiful, for this valley is a jubilee for the eye, when it takes in all the wonders scattered over this space. The Spaniards, who called it the Verde Valley, did a most appropriate thing, for the hills, gently undulating, are with verdure clad the year round. The tall, majestic sycamores, for beauty like unto the cedars of Lebanon, were there in these prehistoric times, for the wood is found in the dwellings. To get up on the heights and see the valleys on every side covered with

vegetation like a green sea adds to the suggestiveness of the name. We have tried in our mind's eye to reconstruct a day in the life of the cliff dwellers at Montezuma's Castle.

What a Sight a Sunrise in That Valley!

Day!
Faster, and more fast,
Boils, pure gold, o'er the cloud-cup's brim,
Where spurting and suppressed it lay—
For not a froth-flake touched the rim
Of yonder gap in the solid gray
Of the eastern cloud, an hour away;
But forth one wavelet, then another, burled,
Till the whole sunrise, not to be suppressed,
Rose, reddened and its seething breast
Flickered in bounds, grew gold, then overflowed the world.

Day Begins with Act of Worship

The watcher in the parapet, like the Muezzin from the minaret of a Mohammedan mosque calling to prayer, gives a cry, and immediately the routine of the day begins in the dwellings. Possibly the first act in the life of the Cliff Dwellers in the morning was an act of worship, a salutation to the sun, a greeting to the dawn; for note this, and note it well: in all cliff communities either kivas or rooms for religious ceremonials have been found, as well as objects of ceremony and worship. The primitive Indian was incurably religious, and took his worship with him wherever he went. Those who excavated the ruins found the paraphernalia of medicine men always and in every place.

Firesticks found indicate that they had, like Prometheus, extracted the secret of fire from the heavens, and the smoke of centuries in the dwelling further testifies to this; so they had breakfast. A celebrated lawyer in California some years ago, in charging an excessive fee, gave as his explanation, "A man must eat." And that was true even of the cliff dwellers; they ate whenever they could get it, and as they built these dwellings to conserve their food supply, soon the women of the pueblo were busy with stone "manos" in hand grinding out corn in the "metates." They knew nothing at all about fashioning metals—objects made of metal are scarcer than hen's teeth—so they cooked on stone or clay.

Getting Ready for the Day's Work

After breakfast, if all were quiet along their Potomac (Beaver Creek), they descended on ladders, either rope-made with yucca and cotton, or on wooden ladders hewn with stone axes, made of cedar, the rungs bound with wet birch, which to-day, after centuries, is just as secure as it was the day it was put on. The farms were down on Beaver Creek, and while the young braves worked—

> There the old smoked in silence their pipes, and the young
> To the pike and the white perch their baited lines flung;
> Where the boy shaped his arrows, and where the shy maid
> Wove her many-hued baskets and bright wampum braid.

Down in the fields they grew cotton, beans, white and red, corn and squash. They added to this food supply by eating the cactus fruit and wild grapes that grew near by, and by eating grass seeds. They domesticated the wild turkey. They trapped the rabbit, the mule deer, mountain sheep, prong-horned antelope, and they were not averse to eating the coyote, the wolf, the fox, the woodchuck, and the pocket gopher. The Indian never was finicky gastronomically. He always was noted for a strong stomach, and never worried about the objects on the bill of fare as long as there were plenty of them. The bones of these animals have all been found in the dwelling or in the kitchen middens, although the bones of mountain sheep, cotton tails, and jack rabbits are by far the commonest.

Scanty Attire a la Mode

Clothing, especially in the summer time, never worried the cliff dwellers. A brave was entirely clothed and in his right mind and had on a costume "de rigueur" if he had a pair of sandals on his feet to protect him from the stony ground, and a G-string or loin cloth about his limbs. We naturally assume the ladies had on more clothing, as they did the weaving. You have to "hand it" to these people when it came to making something out of almost nothing. They took the cotton that grew, and then drew very heavily on the yucca plant, a species of cactus which grows quite prolifically throughout this region. Dean Byron Cum-

strings. Dr. Fewkes of Arizona, a noted archeologist, says that they used two varieties of yucca fiber in weaving. The yucca leaves contain an excellent fiber that varies in texture from coarse hemp to a pliable wire. The same method now used to obtain flax was used by these primitive people, soaking, allowing to rot, and then pounding away the pith with smooth pieces of wood. From the coarser fiber was manufactured rope and heavy cord, used to carry burdens and to make rope ladders. The fine fiber was used as yarn, from which they made sandals and belts, and formed the foundation for leather cord, for they made liberal use of rawhide leathers in fashioning mantles and leggings.

Primitives Made No Sensation

It is interesting to note in studying a primitive people how certain fundamental mechanical and artistic conceptions lodge in the complex mind. About the only time we are liberal in our estimation of the mental qualities of primitive peoples is when we credit them with a large endowment of cleverness. We seem to think that, as far as ideas as to how to do things are concerned, they were a total loss without insurance. And yet in all the ruins spindle-whorls and spindle-sticks have been found. It is said that the Navajos and Hopis, who possibly are descended from these people, use today a similar spindle, only larger, and that except in use as the life-dwelling women did, concerning the amorphous mass of cotton or fine yucca into the most delicate thread, after working it up into beautiful patterns, which showed both originality of conception and artistic design. The cotton cloth found in the cliff dwellings exhibits all varieties of weaves from the coarse burlap to embroidered sheeting.

How the Cave Dwellers Dressed

As the weather grew colder, there was a necessity for more clothing, for in the Verde Valley the snow flies and it gets freezing cold. Cotton cloth has been found showing evidences of careful tailoring, the sewing together of the edges with bone or wooden awls, and openings for armholes. There have also been found bits of deerskin and

mountain-sheep hide, some dressed with the hair on, which possibly made the wearer look like a Carlisle student in a raccoon coat; and others with the hair off, making a nifty leather jacket such as aviators use, although not so finished. There have been found breech-clouts of fiber, also leggings with tubular stockings, which possibly fitted the sandals. It is easy to see why the cliff dwellers, who did so much climbing, should wear leggings for protection. Even to-day the Pueblo Indians, their descendants, wear these same leggings. Leggings have been found consisting of yucca string, wound with feathers. Moccasins of leather and sandals of yucca and cord also have been found. We saw a pair of socks made of cotton and lined with animal hair. Evidently the squaw did not want her good man to get cold feet.

Daily Duties Many and Various

While some of the men were out in the fields chopping cotton with hoes of ironwood or stone, and others were using long wooden planting poles to put new seed in the ground, still others were out digging trenches with wooden and stone shovels, for it must not be forgotten that these earliest people were skillful canal builders. A wonderful system of irrigation is in evidence in the vicinity of Montezuma's Castle. They could secure water out of Beaver Creek, or Montezuma's Well, a huge reservoir, originally made by the falling of a meteor.

Montezuma's Well

Montezuma's Well is seven miles north of the cliff dwellings, and in the early days was connected with the dwellings by an irrigation ditch which can now be traced nearly all the way to the castle. This well is a natural curiosity. It never comes right up to the surface, but resembles water in a partly filled cup. In the most picturesque of surroundings there lies this body of water, 78 feet below, an almost circular limestone bowl on top of which are planted some of the most ancient cliff dwellings. The well is 750 feet in diameter, has no inlet, evidently being fed by thermal springs, for year in and year out, in summer and in winter,

rain or snow, the temperature of the water hardly varies a degree over 78. What the bottom is no one knows, for they could find no trace of it with a plummet which measured 500 feet. The water is 30 per cent alkaline. It now flows into Beaver Creek, thence into an irrigation ditch, has a flow of one million nine hundred thousand gallons every twenty-four hours, irrigates 112 acres, and could be used on a great many more. We saw some of the ancient irrigation ditches which are still in use. They were from two to four and a half feet wide, and averaged about three and a half feet deep. There is still a limestone deposit measuring from 18 to 36 inches on large stretches of the old canal. Think how long it took the water to build up this concretion. No wonder they reckon that the cliff dwellings there are at least three thousand years old. We crawled into one of the underground dwellings, and this was a most remarkable home for primitive people, for it had running water from the well. If they only had a clerk there with a grand air, a stony face, and an insulting manner, they would have all the makings for a modern hotel. On the top of the cliff overlooking Beaver Creek were two large stone dwellings, one containing 8 rooms and the other 20 rooms, with one very large room evidently used for a council chamber, or ceremonial room. Montezuma's Well is an aqueous interrogation point, and has a highly mysterious note about it, for every thirty days there is a disturbance; its waters are troubled, and cast up mire and dirt. It is said that these disturbances are coincident with volcanic disturbances in Mexico. Evidently there is some subterranean connection; but we are not going to commit ourselves for fear Congress is in session, and they may order an investigation. But you will miss it unless you visit Montezuma's Well at the same time you do Montezuma's Castle, for in the early days there was a vital connection between the two. In company with C. A. Clark of Camp Verde we journeyed from Montezuma's Castle to the Well, and we were in all the seven miles never out of sight of a cliff dwelling or a stone house. We visited cliff dwellings galore along Beaver Creek, and we are convinced that in prehistoric times this country was

teeming with population, and Beaver Creek and Montezuma's Well made their life possible; hence the connection.

While some were attending to irrigation others were out in the woods with bows and arrows made of wood, with strings of sinew, the arrowheads of quartz or obsidian—and what beautiful specimens have been found! Others were out in the woods with stone axes, some of them as large as a blacksmith's sledge, and bound to a wooden handle with thongs of leather or with yucca or with white birch withes. cutting down trees to further reënforce their buildings.

What the Women Were Up To

Meantime the women were at home tending to their young hopefuls, who would some day be Hopis, for cradles have been found made of a succession of interlaced cedar handles, and the baby rock-a-byed in the treetop, while daddy tried with bow and arrow to get a rabbit skin to wrap his baby bunting in. Others prepared the dinner, and others still did what women have done throughout all the ages—they ornamented themselves. One of the most interesting objects found in the cliff dwellings was a perfectly round mirror of pure jet, about five inches in diameter, which gives a perfect reflection, proving that there never yet was a pretty woman, or near-pretty, who did not make mouths at herself in a glass. Perhaps they were making vanity bags, such as their white sisters carry to-day, to hold their jewelry and their loose change in the form of wampum beads. And speaking of flappers and their compacts, it is interesting to note that a compact made of pure hematite for putting "that schoolgirl complexion" on the skin you love to touch, was found. They say that the use of soap is a measure of civilization, so we will have to credit the cliff dwellers with something at least—they extracted from the yucca root the amole, which is a very fine substitute for soap, and is guaranteed to make the hair fluffy after a shampoo, so that you can do something with it, and to remove any boughten store complexion.

Experts in Bead-Making

Nowhere in America was the bead-maker's art more de-

veloped than in the Pueblo region. The government scientists say that the beadwork and the minute stone carvings were best between the Little Colorado and the Gila Rivers, with extensions in the south as far as Sonora. In this zone, which included Montezuma's, the beadwork is greatly in advance of that of any other portion of the hemisphere, and it is probable that nowhere else in the world was so great proficiency displayed. This assertion regards accuracy of calibration and drilling, and the apparent ease with which minute beads and astonishingly fine perforations were worked, selection of materials and combination of colors. In some places the bead measures a sixteenth of an inch in diameter, and the perforation is one-thirty-second of an inch. Examination of these beads under the microscope shows a perfection of form. Perhaps they used travertine, or calcium carbonate, or serpentine, or shell. They even used chalcedony, agate, and hematite, boring with a pump drill having a flint point, and using a string of sinews, yucca, or cotton. When you look at these strings of beads you will be convinced that these primitive people were not lacking in the artistic urge, and that their eyesight was not dim or their hands palsied.

Numerous Traces of Carvings and Sculptures

While the women were thus engaged, possibly some of the young men with the artistic temperament, which we do not look for in some people, were out with stone hammer and chisel working as sculptors, making effigies of the gods, representations of men, or carving in enduring stone replicas of the animals found round about—the turtle, the snake, the mountain sheep, the turkey—or perhaps one of the scribes was getting out his "copy" on his most stupendous stone tablet, carving his pictograph, his hieroglyphics telling the story through bear tracks, deer, men, dragon flies, stars. Seeing the birds fly, and like the Roman augurs interpreting the flight as an omen of good, he carved his swastika; observing the whirlwind, he carved the whorl which figures so largely. Or perhaps others were out gathering paint from the ores: from copper carbonate blue and green; from kaolin and limestone white; from hematite

red and brown; from iron ochre red and yellow; from carbon black; from the tinted clays pink and cream. The same artistic urge was in the heart of the women when they made their jewelry. With their little baskets they gathered pitch from the pine trees, and made earrings, putting turquoise on wood or shell. A beautiful turquoise pair of earrings with red inlay in the center was found. The bracelet also caught their eye. They wore down the shell until only the periphery remained. In some cases they used stone. The ruling passion for adornment was strong even in death, for rings, bracelets, beads, have been found deposited in the sealed-up tombs.

Weavers and Potters Par Excellence

In every Indian tribe certain women are adepts at weaving and others in making pottery, and this has been done always with only the most primitive equipment. With only a pair of short sticks, measuring less than six inches in length, some headbands have been found in the process of making, strong and expert in workmanship, matchless in design and coloring. They used in their weaving some artistic and beautiful patterns, the meander, the zigzag, and the triangle predominating. With whatever they could get in their hands, mountain sheep's wool, human hair, turkey feathers, and yucca, they went to work. With rude wooden and stone lathes they turned out pottery that in quality production has made even a highly mechanical age gasp and stare. Some of the pieces are made of a paste so perfect that the surface was not treated at all, the decorations being applied directly to the well-smoothed clay. They made vast ollas rounded in such a shape that you cannot understand how it was done, holding immense, almost unbelievable quantities of water, enabling them to laugh to scorn a siege in their dwellings. They made also seed jars, colanders, jugs, canteens, ladles, and ceremonial objects. When it came to implements of stone, the cliff dweller was in his element.

It Was the Stone Age Literally

His life was as devoid of metals as the proverbial fresh-

man class of ideas. Literally tons of stoneware have been found in the dwellings. We can picture the cliff dwellers faring forth in the morning to get timber for their dwellings or fuel for the fire, some carrying stone axes, hammers, and mauls; others stone saws, knives for peeling the bark, stone shovels for digging up the roots. When the women ground corn, they did it with stone "manos" and "metates," or with stone mortar and pestle. They cooked on stone. They had stone scrapers for tanning or for dressing timber.

It Is Now High Noon

The men are now home from the fields, and others from the chase, bringing with them perhaps a mountain sheep, killed with their bows and arrows. With wooden and stone knives the hide is taken from the body, and with knives and axes the body is cut into pieces. The women have laid aside their accustomed work, and, using the fireplace, the lambent flame they kindle soon reaches the cedar shavings, the fire is made, the meal is cooked, and they refresh themselves. Then again to the work of the day in the afternoon, as in the morning.

Burial Customs

Or perhaps there is a burial. Burials took place in individual graves in the open or in the rubbish of the cliff houses. Sometimes cremation was resorted to. When a body was buried, the idea was to bury it in a curled-over posture, believing that the body should be sent out of the world in the same posture in which it entered the world. Often they buried a brave with his sandals on, and wrapped him about in his martial cloak made of yucca and turkey feathers. Even then how deep was mother-love! In the grave of a child below the floor of a cliff dwelling one of the most beautiful specimens of lacework ever seen was discovered. Evidently the mother, tenderly and with the sacrificial spirit which only a mother knows, wrapped this tearfully around the body of her child. And thus ends the second chapter. Day is dying in the west—

Then, as if the earth and sea had been
Dissolved into one lake of fire, were seen
These mountains towering, as from waves and flame,
Around the vap'rous sun, from which there came
The inmost purple spirit of light, and made
Their very peaks transparent.

Where Did the Cliff Dwellers Go?

Is it a case of some more "lost tribes"? Some people do like to be unduly mysterious, and of course they have a good subject to work on here, for the life of these cliff dwellers began in Arizona anywhere from five hundred to five thousand years ago. We are inclined to the belief that anything found in one of these dwellings is a genuine antique, and no possible mistake about it. Now, where did they go? The story is that these prehistoric people resorted to these cliff dwellings to escape the conflict with more warlike tribes. They were essentially agricultural, and they were compelled to save their crops from the roving bedouins that infested the southwest desert. As soon as this pressure was relieved they possibly sought a new territory. Or perhaps the water supply failed, or the hunting gave out, or the crops failed. Quien sabe? Then, again, that spirit of wanderlust which affects even the white man, making him believe that the greener fields are just beyond, or that he has lost something beyond the mountains and he must go and find it, took possession of their minds. And so they left their dwellings to live on the desert, and merged in with the tribes that occupy that country. Their descendants are possibly found among the Pueblo tribes. Possibly the Navajos and the Hopis to-day are the lineal descendants of the cliff dwellers.

Possibly! All is conjecture.

CHAPTER III

Spanish Explorations in Arizona

NO State in the Union had a more picturesque beginning than Arizona, and yet it was wholly by accident that it was discovered. In April, 1528, the Spanish explorer, De Vaca, who was High Constable in the expedition of Don Panfilo Narvaez, landed on the west coast of Florida with 400 men, coming up from Mexico. They had been commissioned to take all the country from the Palmas River to the Cape of Florida. Hostile natives picked some off, and starvation got others, until 250 were left. These struck out west, and after years of hard and toilsome traveling passed through what is now Texas, possibly also New Mexico and Arizona, and reëntered Old Mexico, going by way of the State of Sonora, which bounds what is now Arizona on the south. In April, 1536, exactly eight years later, four refugees out of the original 400 arrived in Culiacan, Mexico, an old Aztec city, and were there graciously received by the Spanish authorities. They took with them to what they called then "New Spain"—Mexico—imaginations that were running in high. They related the most wonderful stories concerning the Seven Cities of Cibola, all larger than the City of Mexico, they said, the houses of great height, built of stone, and adorned with jewels. As for gold! Why, there was so much of the yellow metal that they used it to make kitchenware. Now the Spaniard was always susceptible to the "yellow fever," or an itch for gold—just like other men, only more so. Immediately he began to turn his eyes northward—and his imagination went to work.

What a Strong, Twelve-Cylinder Imagination Will Do

That early day was the Golden Age of imagination and not verification—it was easy then. All you had to do was say your say and let the facts take care of themselves. In that picturesque age the man with the best imagination was the best traveler, the best historian, the best almost everything; and men so cultivated their imagination that a fellow with even an ordinary imagination could walk off and leave it, and come back two or three months later and find it hitting on all six.

And yet the hectic imaginations of these returned travelers worked out for the good of the order, for the stories they brought back to Mexico fired the zeal of the Spanish Viceroy there, and he determined to send a scouting party to this wonderful gold and jeweled country on the north.

The first white man to begin the work of exploring Arizona was a priest, Fra Marcos de Niza, who held the office of Vice Commissioner of New Spain under the Viceroy of Mexico. He had been a soldier of fortune with Pizarro in Peru, and after coming to Mexico had been given charge of a tribe of Indians to instruct in the Christian religion and in the Spanish language. He had a happy faculty of making friends with the Indians, knew them well, was fearless and tireless and a good traveler. The Viceroy felt that he was the very man for the job in hand. He was to go on foot. With him were sent a negro from Morocco named Estavan, and a bunch of Christian Indians who were to act as interpreters.

They started from Mexico City early in March, 1539. At first another priest accompanied Fra Marcos, but the going was too hard for this ecclesiast, so he was left at an Indian village near the west coast of Mexico, and the intrepid explorer had perforce to proceed alone with his Indian interpreters, the negro servant having been sent on ahead to find out the facts concerning the Seven Cities of Cibola. As the slave could neither read nor write he was to send back a small cross if the stories concerning the gold and jeweled Seven Cities were true. So much for human

understanding and the power of verbal exaggeration. In a short time some Indians returned, not with a "small cross," but with one as big as a man—life size, as it were. The story of the Seven Cities was not only all true, but the half had not been told. Instead of seven cities there were ten, and these were so thickly plated with gold that former stories of the seven paled their ineffectual yellow fires. The colored race are ever accommodating, and invariably tell you what you want to believe, and a "leetle the rise."

Fra Marcos was highly gratified, but he was not unduly flustered; he was too wise a man to take the report other than "cum grano." However, he continued his journey on foot. I wonder if to-day we realize what that meant then—traveling over uncharted mountains and scorching deserts, with wild Indians and wild beasts on every hand; no place to sleep except on the ground, and practically nothing to eat unless you secured it by your own efforts. Present-day man can hardly walk across the street. Talk of walking a mile and he looks at you aghast! But here was a trip under the worst conceivable conditions covering a distance of hundreds of miles. In a few days he reached the Sonora Valley, and took possession of it in the name of Spain. At the head of the valley he passed over the divide, came into the Valley of San Pedro, and in a short while was in the territory now known as Arizona. He then crossed the Gila River. Through interpreters he got word of his negro advance agent, who was going through the country like a one-man minstrel show, adorned with flamboyant geegaws, and carrying a highly ornamented gourd as a scepter. The Indians who had never seen a negro before evidently took him to be a living image of one of their gods in ebony. This was not at all displeasing to Estavan: he admitted it, and he certainly did strut the length and breadth of the Arizona country. This outburst of Indian laudation, however, went to the negro's head, just as a bottle of corn whisky will go to the head of a man who has just completed a hunger strike. He traveled like a conquering king, with a large retinue of Indian servants—squaws in generous numbers.

On May 9, 1539, Fra Marcos left the Gila country, fol-

lowing Estavan's trail. For nearly two weeks he traveled over the White and Mogollon mountains. When nearing the continental divide word reached him that Estavan had been murdered by the Indians. It seems that the negro arrived at the gates of one of the Cities of Cibola, and had sent his royal scepter, a gourd, to the chief of the village. The suspicious Indians probably linked him up with a hostile medicine man, and being angered with his impudence warned him that he advanced farther at his peril. He disdained the warning and went forward with all his bizarre trappings and geegaws. They killed him. A strange Indian tradition is that they led him out to a cliff at the edge of the town, and the wise men of the tribe kicked him so hard that he did not hit the earth till he landed in Mexico. Even an Indian may have a sense of humor. In point of fact the likelihood is that the Indians stoned or clubbed him to death.

Though Fra Marcos heard all this he did not let it deter him from his purpose. He set his face steadfastly to the goal, at last came in sight of the village, planted a cross facing it, and conducted religious exercises. He did not wait to be entertained in the village, which proved not all that fancy had painted. There was little gold, and not much turquoise. The houses, however, were well built, and the people seemed prosperous and in the enjoyment of a certain degree of civilization. Believing discretion was the better part of valor, he extenuates nothing when he says himself that immediately, and with a good deal of celerity, "with more fear than food," he made his way back to the City of Mexico, traveling on foot through the howling desert and in the heat of summer, with a plentiful lack of food and water, and not even an understanding companion, and with nothing to guide him by day save his pocket compass and his trained sense of direction, and at night the kindly stars. It was a man-sized job, but he finally got there. It took him several months to reach Mexico City.

He told his story to the Viceroy, who was all fired up over parts of it, and who evidently banked large on finding gold and precious stones in abundance. So obsessed was

the Viceroy with this notion that he commissioned Don Francisco de Coronado, brave soldier, intrepid explorer, after whom an island in California is named, with a company of 300 Spanish cavaliers all dressed up in armor, on prancing horses, and with flashing swords—the pick of New Spain—to take over the country.

Came the Conquistadores, "Conquerors"

Thus entered the Conquistadores, and a large chunk of colorful history. Imagine 300 plumed and belted knights, gaily bedight, all incased in steel armor, and looking for all the world as if they had stepped out of the pages of Cervantes, or Sir Walter Scott! We can hardly conjure up the picture of a company like this traversing the Arizona desert; and not only that, but following them came footmen armed with crossbows, just as if they were going out to fight the Moors. Shades of the Middle Ages! Others with the harquebus, primitive great grandfather of the shotgun; then the artillery, heavy guns loaded on mules; then the commissary department on hoof—cattle and sheep galore. It is a picture, and mighty interesting.

Coronado and his men followed closely the route of Fra Marcos, and came at last upon the Indian village supposed to be the capital of Cibola. These Seven Cities, by the way, were not in Arizona, but were Zuni cities in what is now New Mexico, and nothing at all like the press agent's report, no matter where they were. When they located the city they forced their way in at the point of the sword. They found that the stories they had heard of its glory had to be discounted about ninety per cent plus, as far as the gold and precious stones were concerned. However, the people were far advanced agriculturally; they lived in good houses built of stone, and were well dressed in skins and cotton cloth. Coronado remained there some time. He sent one of his lieutenants, Don Pedro de Tovar, with some cavalry over into the Hopi country, and it was this side trip that resulted in the discovery of the Grand Canyon. Still there was no gold, and no precious stones except some turquoise. Weary and sick at heart with disappointment, chafing over his battles with the Indians, Coronado re-

turned to Mexico City with the bad news. When he told the Viceroy that there was no gold the circumambient temperature fell sixty degrees in five minutes. They suddenly lost all interest in the country. Not until forty years later, in 1582, did another expedition come up, although individual bands may have done so. However, from that time on the white man, omitting a few years when the Indians overwhelmed him, has occupied the country.

Tucson, Colorful—and Cultured

When Fra Marcos was trekking northward in 1539 he arrived at an Indian village which the Papagos, or "painted ones" as he called them, denominated "Tucson"—which means "Black Water," due to the presence of a mineral spring with darkish waters. This was the first touch of the white man to a town which for hundreds of years was the historical center of Arizona, and which still retains the liveliest interest for those students who would know and feel the past, for you feel it when you get there; there is something athrob in the very atmosphere of the charmed city. It is teeming with the spirit that makes romance and history which neither time nor custom has staled, and the Old Pueblo with its picturesque Spanish houses and people and customs, its ancient traditions, its graceful charm, has that indefinable something which artistic souls love. These enchanting qualities are still there. We never get off the train there without feeling that we are in a land of enchantment. Everything seems too good to be true, and we have a suspicion that will not down that perhaps the famous wizard, Prester John, has been there before us, and we expect to walk at any time into his palace, where the door is a great big diamond, and the hall a hollow ruby, and we are liable to stumble on an opal like a sunset-colored cloud. In Tucson we are so spiritually lifted that we dream dreams and see visions. We discern Fra Marcos and his Indian guides wending their way to the Seven Cities of Cibola in 1539. We see Coronado and the colorful Conquistadores, "Conquerors," passing through in 1540. In 1552 we find a messenger of the King of Spain granting a charter to El Pueblo del Tucson, which, by the way, would make it the

oldest town in the United States, as Santa Fe, New Mexico, was settled in 1555—three years later—and St. Augustine, Florida, in 1565. If there was no Spanish settlement at this place, why did the King of Spain go to the trouble to grant it a charter? In 1582 Antonio de Espejo found gold near this mineral spring. What was more natural than that Tucson should be one of the first places visited by those planting missions in this new country? In 1690, some say 1692, that great pioneer priest, Eusebio Kino, with Padre Salva, came and founded a mission among the Papagos, which has endured to this time. Following these barefoot friars and Spanish Conquistadores we see a procession of Spanish settlers enter Tucson, dashing dons and beautiful señoritas, and Indians clad in the brightest colors—and colors only. And next we see those pioneer Americans, bearded like the pard, and swearing strange oaths, and risking their lives daily in imminent deadly conflicts. This was the day when Tucson was "Wolfville," when time was measured by drinks—first drink-time, second drink-time, and so on, when most of the business houses conducted by the "Americanos" were either saloons, dance halls, or gambling houses, and were never closed.

But those days are gone forever, and in the Tucson of to-day you get the best of all its picturesque past with an up-to-date, high-class American city. Some of the finest people in the country live here, and the University of Arizona, which stands high in the educational world, is making a name for Tucson as the "Athens of Arizona." Fine homes, cultured and courteous people have the good fortune to live in this city, which is old, yet ever new.

Fort Tubac—Father of San Francisco

There are two places of unusual historical importance near Tucson: first, Fort Tubac, an old Spanish fort on the highway to Nogales. It was from this place that the commander, Juan Bautista de Anza, on October 23, 1775, with a small company of soldiers and 136 men, women, and children started out to form the first settlement on San Francisco Bay. After a hard trip they reached the place that was to be San Francisco in April, 1776, the year

American independence was born. Some of the remains of the old adobe buildings are still to be seen at Fort Tubac.

Tumacacori—Ancient of Days

On the same road, and eighteen miles from Nogales, stands the Tumacacori Mission, built in 1754. This was forty-three years before San Xavier Mission was erected. In 1751 an Indian uprising compelled the mission to be abandoned. The work was resumed, but in 1840 the mission was burned, and has never been used since as a place of worship. It was built of brick and adobe with massive walls. The main building is but a wreck of its former self, and yet it is picturesque. There is a beautiful dome on the back part of the building, and in the courtyard there is a mysterious round tower built of bricks, which it is said served as a morgue in the early mission days. A little back of this is the cemetery. The mission, which was built among the Indians who had their "fields behind the low fences," still bears evidence of the hard work and dangers of that early day. Some of the wooden beams bear the mark of the flame, for the record is that the building was fired by flaming arrows being shot into it. It is said that recent excavations show that copper was smelted in that vicinity at a very early period, for ruins of an old smelter run on a primitive scale have been found.

San Xavier del Bac Mission

This mission is set on a hill eight miles south of Tucson, and is beautiful for situation, at a place the Indians called Bac, or "flowing water," fronting south, and, like Solomon's temple, surrounded in the distance by mountains. It was founded in 1692 by Fra Eusebio Kino, an Italian, who entered the priesthood in Austria, and came over to Mexico in 1681 as a missionary to the Papagos. In 1687 he came to the State of Sonora, and in 1692 visited this spot. In 1700 he laid the foundation of a mission, which formed one of a chain extending from this point on the north, through Sonora, Sinaloa, and Lower California. The Jesuits were expelled by order of the Spanish King in 1767, the Franciscans succeeding them. How much of a church was

Mission of San Xavier del Bac, near Tucson

built at first we do not know. Possibly enough was done by the Jesuits to allow the mission to retain its name in honor of one of the founders of that order. However, the date 1797, put on one of the doors, is regarded as the time when this building was completed.

The Seven Lamps of Architecture were all burning with a bright and shining light when this magnificent temple was first built in what was then a howling wilderness, inhabited only by a handful of Spanish, and hordes of painted, unwashed Indians. To see the solid work put on it, for it is built of fire-brick; to behold its beautiful towers and magnificent dome, which architects have traveled far to see, convinces you that only sublime devotion to a great cause would prompt men to go to such trouble and expense in that day. Where did they get the brick and the costly material that went into this cathedral-like church in the desert? for it is of goodly porportions, being 67x105 feet front and side, and its towers and dome rear themselves grandly in the sky. It is one of the finest examples of the mission style growing out of the Spanish Renaissance. And yet it is not a mere copy of any of the great churches of Spain or Mexico. It is highly original in that it is a startling and artistic merger of three distinct types of architecture: Byzantine, Moorish, and Aztec. Its general construction is Byzantine. When we see this church built in the form of a Greek cross out in the desert our mind conjures up visions of the old Greek city of Byzantium, where Constantine moved the imperial capital early in his reign. Its desert surroundings help to suggest the East, and we would not be surprised to see a Bedouin with white burnous walking the sands near by. All lovers of the beautiful know what a fascination this almost Oriental architecture has on the mind, no matter where we find it. It was born out of the Basilica, that is true, but it so touched the imaginative and colorful Orient that the three-aisled feature of the Roman churches, which resembled public buildings too much, was soon lost sight of. Constantine's going to Byzantium did not only divide the Church theologically, but architecturally. The Romanesque, in the form of a Latin cross, was characteristic of the West, but the Byzan-

tine in the form of a Greek cross with equal arms, spread all over the East, especially into Russia, where they flattened the dome into the shape of an onion, with slightly curved and fluted lines running over the surface.

There are some things about San Xavier that remind us, though on a small scale, of the Church of Hagia Sophia at Constantinople, which is now a Mohammedan mosque, and has had minarets added; and there is also a slight, yet haunting, suggestion of St. Mark's at Venice, which is a very fine example of Byzantine. This beautiful style of architecture, cruciform in shape, with brilliant and highly colored interior decorations, reveling in rich reds and deep blues, vermilion and gold, had its effect upon the Saracens who conquered the Eastern empire. By the Saracens this beauty in construction and decoration was carried into northern Africa and southern Spain. From Spain it was carried into Mexico, and the Mexican builders at Bac put it into a lasting monument on this fertile soil. The lower half of the interior decorations, the wonderful colors and figures, the frescoes, the statuettes, are all Byzantine; while the upper reaches, the groined arches, the windows, are Moorish, as is the façade with its Moorish design and arabesques. The dome, which is a thing of beauty and suggests that most beautiful and picturesque building in all of old Spain, the Alhambra, is, of course, Moorish.

And then there is another touch added to this building which completes the perfect work, and that is the accentuated, yet restrained, Aztec. The distinctive towers and belfries are said to be native to Mexico, and some of the interior decorations likewise show that the builder brought abiding memories of his native land with him. We do not know where this trinity of architectural beauty, the Byzantine, the Moorish, and the Aztec, shows to better advantage than it does here. It rounds out a work of devotion, both of missionaries and builders, which gives all the surrounding atmosphere. This was built in the day when men loved art for art's sake, and threw themselves into their work, and labored for the greater glory of all the world. This building alone is worth a trip to Tucson to see. It is in a fine state of preservation, and is in daily use, continuing as a mission to the Papagos.

CHAPTER IV

Grand Canyon of the Colorado, in Arizona

WRITING on the Grand Canyon puts me in mind of a phrase in the marriage ceremony: "It is not to be enterprised in, or taken in hand unadvisedly, but reverently, discreetly, advisedly and in the fear of God."

Only the Inspired Writer Could Do It Justice

Ever since I saw the Grand Canyon in the spring of 1913, I have been trying to write about it. I always put it off because I felt I was not in the proper condition physically, mentally, and spiritually to do it justice, for a subject so stupendous takes spiritual insight and inspiration; lots of it. But throughout all these years I have cherished a hope that some day the inspiration would strike me just as it hit John Dryden with full force and all of a sudden when he sat down and composed "St. Cecilia's Ode" in forty-five minutes, or that I might have the same measure of poetic inspiration that Coleridge had when he wrote the first part of "Kubla Khan."

I have even thought throughout these years of going into a course of training in order that I might do the subject proper justice. A football player has to go through a course of sprouts; so does a tennis player, a wrestler, and a pugilist. When they are up against the stiffest proposition of their lives, when the great combat is just before them, they subject themselves to rigid training. Why shouldn't a writer do the same thing? Why not spend a few months hurling the medicine ball of adjectives; big adjectives, double-jointed adjectives, sesquipedalian adjectives; skip the rope with sinuous and shifty adverbs, go through a strenuous course with the punching bag of particular prep-

ositions, and run for miles with nimble, lambent, lightning-footed verbs? For he who tackles a great literary subject must have a stout heart, an unbroken wind, and his withers unwrung. I thought of this for years, but have never had the time to do it, for throughout all this time I have felt like a professional juggler, or a drummer in a modern orchestra; I have had so many things to do at once that I have almost gone into dissolution trying to do them. But you ask, "If this is the case, why are you writing on it now?" To which we reply, "We are writing, my dearest Matilda, because we can't help it; we just have to get this thing out of our system. It has haunted us like a nightmare all this time, and the only way we can get rid of it is to write about it, just like marrying a fellow to get rid of him." So here goes.

It was stated of John Keats that he was nothing but an apothecary's clerk, when he dropped in a friend's house one night going home from work, and saw a translation of Homer. He read it, and he was a changed man from that time on. He determined to build no more boluses and cram no more capsules; he was a poet, and everybody soon found it out. If you will read his sonnet "On First Looking into Chapman's Homer" you will find that he regarded it as if a new world had burst upon his sight. He said he felt like a man who stood on a mountain peak in Darien and discovered a great big ocean, or like an astronomer who discovered a new star.

I know what he meant, for that is the way I felt when I first saw the Grand Canyon. I left Williams, Arizona, early one morning on the Santa Fe, bound for the Canyon, and my heart was all astir with expectation. But after we had been on the road three hours, and I was looking out of the window on the left-hand side of the train, the Canyon literally exploded on my sight. John Keats never got a greater kick out of Chapman's "Homer" than I got out of the Canyon; it opened a new world before me.

Fools Will Babble Where Angels Fear to Speak

One of the finest aids to an appreciation of the Canyon is silence, and lots of it. In the Opera of the Mikado, Koko

has a list of people for the Lord High Executioner's sword "who never would be missed." One of them is the untrained goat who insisted on breaking up a private conversation. My candidate for a reserved seat in a red-hot electric chair is the untutored biped, sans feathers, who insists on gabbing and pouring his wooden wit into your shell-like ear, wondering, mayhap, how many million tin cans it would take to fill up the Canyon, while you are struck dumb by the beauty before you. A man should approach the Canyon as he approaches a sacrament rite, his soul awed and thrilled by the mystic and wonderful handiwork of God which stretches out before him. Think of a man standing at Hopi Point looking toward the west, while the Great God of Day like a lavish spendthrift is clothing the hills and the jagged peaks for miles with a layer of cloth of gold, and then think of that silence being broken by some fool remarks, when the whole occasion is too sacred for words.

The Latest and Greatest World's Wonder

Solomon said that there were three things too wonderful for him, yea four: "The way of an eagle in the air; the way of a serpent upon a rock; the way of a ship in the midst of the sea; and the way of a man with a maid." I can go Solomon one better, and say that there are five things; and the last and greatest of these is a man who comes to the Canyon on the morning train, spends about half his time eating and lolling around, and then rushes off on the afternoon train. Of course if a man can spend only a day, he ought to intensify by spending all his time in the Canyon, but in order for a person to get a real appreciation of the Canyon he ought to stay several days. Don't get the idea that, because you are out on the Arizona Desert, you will not have comfortable accommodations. You will be surprised. The El Tovar Hotel, while not expensive, can easily satisfy the taste of a millionaire, while the Bright Angel Hotel is within the reach of the poorest preacher. And you will not go hungry. The dining service is Fredharvey, which is a word I have just merged, and is a synonym for all that is wholesome, efficient, clean, and

reasonable in things gastronomic. You will miss half of your life if you do not see a sunrise in the Canyon, when the mists of night have rolled away, and Phœbus, driving his sun chariot, gilds all the walls with a rosy glow. The man who has never seen the Canyon at night, when Selene, the beautiful goddess of the sky, is throwing down her largess of silver into the lap of the Spirit of the Canyon, hoping to move his great soul even with gifts, cannot appreciate this great place. A man ought to see the Canyon under all possible conditions in order to learn something of its varying moods and tenses. I have been there in the spring, when the meadow larks were singing in the pine-clad forest of Coconino which skirts the rim, and the wild flowers were there scenting the air; I have seen it in the summer, when the straight rays of the sun changed the facial appearance every hour, when the succeeding picture of its many terraces was even more ravishingly beautiful than the last one; I have seen the lightnings come out of the dark clouds that hid its southern bank, and I have seen the red fire leap from crag to crag and peak to peak, like a 16-inch gun of a battleship spitting its long tongue of flame from behind a smoke screen. I have heard the thunder crash and reverberate again and again in its multitudinous canyons, until it sounded like ten thousand dynamic guns were rehearsing the battle of the Somme with the original cast. I have seen it in the winter when a snowstorm was raging, and the dark clouds hung low in its cavernous depths, hiding it like a beautiful maiden behind a thick, dark veil; and then I saw the Sun advance with his broad sword of silver, hacking the clouds with its flashings of light, and revealing its glory, as if God's masterpiece had been born anew. And yet I long to see it again and again.

Know It Intimately or Know It Not

No one knows the Canyon until he has explored it from top to bottom. Stand on its rim at a place where the Colorado River seems to be shut up in a few feet of wall space, and where it seems like a small band of silver flattened on the surface, and you begin to think that the river is a very small affair. Yet, if you were to place a big city

Grand Canyon, Arizona, near Mariposa Point

sky-scraper, say fifteen or sixteen stories high, down on the banks of that river, it would seem like a very modest piece of architecture to you at the top. The way to realize this is to go down into the Canyon, studying the tints on the walls of the Canyon as you descend, and discover colors that you never dreamed existed. Get an idea as you go of the wonderful geological transformation which took place in this spot, the most favored spot in God's universe, where He loved to work so well. Have a dozen or two thrills going down the precipitous and ever-winding Bright Angel Trail, and get so frightened that you believe it was so named because so many bright angels were made by those who fell to the yawning depths below, as you are sure you are going to do in the next few minutes—but you never do, because you instinctively trust to your mule and not to yourself, and the mule has a good deal of "horse sense." Then when you get down to the river you will find, not a placid band of silver, but a mighty rushing stream, the architect and builder of the mighty work which enthralled you.

A Product of Eons of Time and Forces Titanic

Yosemite Valley was made by glacier action; there is no doubt of this, for the unmistakable proof is found in the glacier polish on the hard, granite face of the rocks around Vernal Falls and other places; also in the presence of near-by terminal moraines, and in that glacier lake, Mirror Lake. But the Grand Canyon was formed by upheaval and erosion. Originally it came forth out of the waters, the ancient archean rock coming up above the surface of the flood, like Aphrodite arising from Old Ocean's foam. Probably the archean rock at the bottom of the Canyon was one of the earliest pieces of land on the American continent. After the archean the nonconformable strata of the Algonkian appeared, being thousands of feet in height. Then a small area of the Cambrian, and then possibly three thousand feet of the Carboniferous. In some countries where there were quantities of decaying vegetation the Carboniferous age produced coal. But here in the Canyon the entrancing reds in limestone and sandstone, the colors which give the

Canyon its beauty, were produced. There are other layers over the Carboniferous, ranging from the Permian to the Eocene, or recent. Now it is only a little over five thousand feet from the rim of the Canyon to the Colorado River. The geologists, however, say that at one time these layers of rock were over thirty thousand feet high. They stood straight up. But seismic disturbances caused a tremendous tilting, which threw them backward and reduced their height. Also it is figured that over eleven thousand feet of the Algonkian is gone, due to tilting and erosion. The top layer, the Eocene or recent, has been washed off by the flood of waters possibly for fifteen thousand feet. The great seismic disturbance broke the surface, driving the first wedge for those majestic and imposing terraces which make up the Canyon, and then the waters, many waters, developing river beds, like teeth of bitted steel, gnawed at the hard face of the Canyon until the miracle of separation was accomplished. These rivers finally disappeared, leaving the Colorado alone to do the work of sculpture, and work its way down to the river bed.

We often say that the constant dripping of water will wear away a stone, and we have proof of it here. What a marvelous worker is Nature, and what an artist. You never appreciate Dame Nature until you come to the Canyon. A sunset viewed from Hopi Point is the greatest picture ever painted.

The Seven Wonders of the Ancient World Merely Petty Antiques

The seven wonders of the ancient world were the Pyramids of Egypt and the Sphinx, the Hanging Gardens of Babylon, the Temple of Diana, the Statue of Jupiter Olympus, the Tomb of Mausolus, who was king of Crete about 360 B.C., Pharos, or lighthouse of Alexandria, and the Colossus of Rhodes. Compared to the Canyon these little antiques are mere play-pretties. We rave about these things, and we go into raptures over the sculpture of Phidias, Praxiteles, and Michelangelo, but these were mere neophytes and bunglers compared to Nature. The Olympian Jove as a piece of sculpture falls far below the

Hammer of Thor in the Canyon. The Temple of Diana pales into insignificance beside the sculptured greatness of the Temple of Isis. Temples, battleships, cathedral spires, all rear themselves grandly in the most wonderful spot on earth.

Think of standing on the rim of the Canyon near El Tovar—the opposite rim is thirteen miles away—and viewing this piled-up majesty as far as the eye can reach.

They tell us, "See Naples and Die," but we tell you to see the Grand Canyon and begin to live. People rush off to Switzerland to see mountains that could be placed in the Canyon and almost lost sight of.

The Hopi Indians say that the Grand Canyon is an entrance to their heaven, and all we can say is that they have a wonderful sense of location. However, there is no doubt of it, this Greatest Thing in the World is an aid to reflection and spiritual devotion; its vast reaches and its immensity speak to the mind of the Infinite and the All-Powerful.

CHAPTER V

The Painted Desert of Arizona

IF the Grand Canyon in Arizona is the greatest thing in the world—and it is—then the Painted Desert of Arizona and the Petrified Forests are the most unique things in the world. Yet visitors to the Grand Canyon pass very close by the Petrified Forests and the Painted Desert and never know what they are missing.

"What are you getting off at this 'whistling post' for?" a man asked me—an intelligent-looking man, too—as I was preparing to leave the train at Adamana.

"I am getting off here because the Petrified Forests and the Painted Desert are only a few miles from here."

"Never heard of them," said the man, looking at me as if I had announced that I was getting off to get a pot of gold at the foot of the rainbow.

And yet in a few days' visit to this apparently deserted place you can spend some of the happiest days of your life looking at the most unique things in God's universe. Arizona is not what the Eastern tourists think it is—simply the Grand Canyon and a land of desert so dry that it takes forty acres to rust a nail. As a State it is crammed with marvels second to no State in the Union; and one of the greatest and most misunderstood marvels is the Desert, of which the Painted Desert is the most interesting part.

How much do you really know about the Great American Desert? Do you know that our desert covers over one-half million square miles, and that, if you count the land that extends into Mexico, it reaches a total of nearly a million and a quarter square miles?

Some Misconceptions of the Desert

Is your thought of the desert a flat, treeless plain without water and without life, fit only to be likened to the forks-

of-the-creek weekly paper, with nothing in it but gossip and patent medicine advertisements—an awful waste of space? Do you know that the desert ranges at all elevations from below sea level to thousands of feet above, and that there are many hills of great elevation in it; that vegetable life is there; that there are great underground rivers—"streams in the desert," as Isaiah describes them? Their presence is made known here and there; and if the water is but brought to the surface and you tickle the land with a hoe it will laugh at you with a harvest.

We have no accurate means of determining the length and breadth of the Painted Desert—indeed, we do not know if it is possible to measure its exact size. It extends in a more or less irregular line between the canyons of the Marble and the Colorado Rivers. It is a desert within a desert, and the dispute as to its size is due to the fact that in many places it seems to blend with the neutral gray of the larger desert; and then, after a little distance, its lively, bright colors appear again.

The first mention of the Painted Desert in history is made when, in 1540, the Spanish adventurer, Coronado, on his way to California from Northern Mexico, came into the land of the Hopi Indians, and found the desert to which the Spaniards gave the name of "El Pintado Desierto" (the Painted Desert), which name it has borne ever since.

The old Santa Fe Trail, which so many of the Missouri and Kentucky pioneers used when they came out to California in the early days, passes through a corner of the Painted Desert, right near the town of Adamana. But in spite of the fact that so many of the pioneers passed right through it, it has remained a "terra incognita" to most of the world until this day.

Nature's Wonders Easily Accessible

And here is the funny part of it: you can reach the Painted Desert and the Petrified Forests in safety, comfort, even luxury, for it is on the main line of a great transcontinental railway, the Santa Fe—150 miles east of the Grand Canyon. You get off at a small town, Adamana, which boasts a

population of thirty-five when all are at home, present, and voting. It is a little town, and we are glad of it, for it would be a shame to surround all these wonders with too much materialism. Bethlehem was a little town, too, but the greatest thing that ever happened in the world happened in that little town, and the greatest marvels in the world, outside of the Grand Canyon, are right here. All that is essential to a satisfactory and uplifting visit to the Painted Desert and the Petrified Forests you will find in Adamana. Here is a good, comfortable, clean, well-kept hotel, presided over by a cultured competent lady, Mrs. Elnora Saunders. Home-cooked food, fit for a king, and in great abundance, is served you. It is the nearest point to all these wonders, and you visit them with a good guide and a comfortable car.

Our Guide a Product of the Desert

We started out from Adamana on an early November morning in a comfortable closed car driven by Mr. Harvey Smithson, and it is quite appropriate that one whose name resembles the Smithsonian Institution should dwell where wonders abound on every hand. Harvey used to be a cowpuncher in these parts in the early days. He grew up with the desert, and in it; and it is typical of the West that he has discarded the hurricane deck of a broncho for a comfortable seat at the steering-wheel. You are in a land of enchantment and wonder and mystery, and you are almost sitting on the top of the world as far as altitude is concerned, and you are actually doing it as far as scenery is concerned. You may be having a hard time in life, but as you ride, on a crisp, cool November morning, in the golden Arizona sunshine, you are glad you did not die last year before you had a chance to see all this. You go bowling along over the highroad, and then suddenly you come to what seems to be the edge of a precipice. You are on the highland, and the Painted Desert in all of its polychromatic wonder spreads out before you. It is a sight for sore eyes! As far as you can see—and you can see quite a distance in this country of rarefied air and golden sunlight—an ensemble of colors, rich and beautiful beyond description,

stretches out before you, league on league and mile on mile. The auto can go no farther, and so you begin the descent of the long, long trail a-winding amidst the richness of this the world's most wonderful color scheme. Right away you step into two marvels at once—the Sigilaria, or Black Petrified Forest, and the approach to the Painted Desert. The ground in which the Black Forest is located is the most wonderful shade of olive green we have ever seen, for this is the introduction to the beautiful shades of the desert.

Petrified Forests—Black and Agatized

Just a word as to the Black Forest: Here the trees went through the same process of petrification that the trees a few miles away in the Agatized Forest went through, with this difference, however: While in the Agatized Forest there was only one kind of tree, here there were two—palms and pines—and the process of petrification was probably accomplished in the Carboniferous Age. There is also this difference: In the Agatized Forest you are struck by the variety and richness of color, until you could imagine you are in a great jewel factory in the process of making. Here you feel that you are in a forest of mahogany, only the delicate, hairline tracery of the most wonderful ferns in the world shows that in some far-off age a celestial giant artist left his "stamp of the fern" on the side of a giant palm or pine. But a short distance from the Black Forest, and you are right in the Painted Desert proper. A sight breaks upon your eyes that you can hardly credit. For miles in the distance you see the most marvelous riot of color. You always imagined that the desert was colorless; but if you could be blindfolded and brought here you would imagine that you had stumbled right onto the ground floor of a rainbow factory.

A Veritable Riot of Gorgeous Hues

Lavender seems to be the favorite color, as if the desert were a pale society beauty. But then there is red, light and crimson, as if it also were a young girl and lively, and with all shades of red between the light and the crimson. Then there are greens—olive green and the brighter shades; then

blue—as blue as the light skies above, and a bluish mass of ultramarine that Neptune might have secured here when he put his bluing in the deepest parts of his ocean. Here is a patch of unearthly white—"whiter than any fuller of earth could make it." Here is a chocolate color, and there a rich gold-brown, which, unless you get a firm grip on yourself, may make you believe that in some golden age in the pleasant past the sun spilled out here in wooing this wonderful piece of earth his heart's richest treasure. You are fully persuaded now that, if not a rainbow factory, it must be the earthly palette of some celestial artists, who, in the calm solitudes of the desert, when no human eye can see, mix here the colors that they nightly spread in the west. Or perhaps it is where they manufacture the Spectrum, for they have all the colors, and in quantity production. To change the figure, if Nature wears a garment of earth anywhere she certainly wears here a most highly colored and variegated Scotch plaid. A chameleon would naturally explode in this desert trying to change to all these colors. You have here another surprise awaiting you: Instead of the desert conforming to the traditional conception of being as flat as the palm of your hand, you have hills—perfect mounds of piled-up color, and not only one color in a hill, but several; and each hill trying to outcolor its neighbor.

Nature's Artistry Baffles Analysis

The question is, What causes all this wonderful coloring? We do not pretend to know; but when you get down on the floor of the desert and kick it, it is so fluffy that it seems to be colored volcanic ash, caused by the presence of minerals, iron, manganese, and other mineral solutions which infiltrated in. One thing is sure: this is a volcanic country. You do not have to go far to see the evidence on every hand; the black volcanic rock is everywhere. On the eastern edge of the desert there is an extinct volcano called the Inkstand, with a crater half a mile in circumference. From the mouth of the crater there has solidified a mass of lava rock as black as midnight, and looking like coal-tar on the mouth and sides of a bucket. Perhaps this accounts for the dark

coloring on the edge. Even the scientists who have studied the subject are not agreed as to the cause of all the desert coloring; and when scientists disagree it is no time for a mere layman to rush in with a conjecture; but it is just as wonderful no matter what caused it. You are in the presence of not only an infinite mystery, but you are in the presence of something that you cannot see in Europe, in Asia, or Africa, though you tramp these countries from one end to the other. And another mystery is, Why should Americans rush off to foreign shores to see things, when here in the good, old U. S. A., on the main line of the Santa Fe, you can see something which will give you such a thrill that you will thank God you are still alive?

The Solitary Places God's Meeting-Ground with Man

The Lord God Almighty must have loved the desert, for he made so much of it. In every hemisphere he spread it out with a loving and lavish hand. And for a purpose. The desert declares the glory of God, and its immense reaches show his handiwork. The morning speaks of his glory, and the night reëchoes it. Did you ever stop to think that all great religions started in the desert? When the Lord called Abraham out from the idolaters he led him into the desert to learn the Oneness of God and the great lesson of faith. Before Moses went into the desert of Midian he was the most impetuous of men; after he came out he was the meekest man who ever lived. He had to leave the crowded cities of Egypt and the artificial and wicked court of the Pharaohs before he could find God. In his blind rage he slew a man, and had to go to the desert to learn patience and meekness. He never would have been fit to lead his people had he not become a desert dweller. Here God appeared to him in the burning bush, just as he nightly revealed himself in the flaming desert sunset you can see nowhere else. The desert is God Almighty's theological seminary. Before our Blessed Lord began his ministry he was led for forty days into the wilderness, or desert. After St. Paul's conversion he was compelled to spend three years in the desert of Arabia. Other

Fantastic Shapes, Painted Desert.

religions started there; witness Mohammed in Arabia, and Buddha in India. The Bible is a product of a desert land, Palestine, and all of the writers were desert dwellers. Call the roll and see: Moses, Isaiah, Daniel, Ezekiel, Jeremiah, David, Solomon, Amos, Hosea, and all the rest of that long list of inspired men who wrote the sacred Word. The early Christians gathered strength there. Athanasius, Origen, Jerome, and that wonderful company of Church Fathers—they went out into the desert not so much to get away from man as to find God—for he is always there. No wonder the Arabians speak of it as the Garden of Allah.

We have spent weeks and weeks in the Arizona desert, in the north, south, east, and west; in summer, winter, spring, and fall; morning, noon, and night; and all places, seasons, and hours are wonderful. Each succeeding scene seems more entrancing than the one that went before. We have seen the sun sending out his advance guards in the morning, clothed in white samite, mystic, wonderful, before coming behind the jagged mountain peak in a blazing ball of golden glory. We have seen the day spread his mystic haze like a gossamer mantle over distant terrace, hill and mountain, one miraculous transformation of the face of the fair earth being drowned in the greater miracle of the next; and you didn't think it could be possible.

The Matchless Glory of the Desert Sunsets

And the evening sunsets! Many a time and oft we have seen the sun sink into the Pacific Ocean at the Golden Gate and the glory that was revealed made us know why it was christened "chrysospulæ," or the Gate of Gold. But a sunset even here is like a tallow candle compared to the light of the Great God of Day in the desert, and if you ever see a sunset in the Arizona desert you will be like the boarding-house poet who refused to eat strawberries because it would spoil his taste for prunes. The desert will spoil you for sunsets elsewhere. And if you haven't seen what we are writing about you haven't been anywhere and you haven't seen anything.

But, as we say in California, "it's the climate" that makes the sunsets in the desert so wonderful. You can't get the same conditions in any other place, because it is a collaboration between the desert, the wide-open spaces, the rough, jagged, majestic porphyry mountains, the air—which is really colored—and the enchanting, blazing sun. You can get this only in the desert. If there are clouds in the western sky, so much the better, for the heavens will then be fretted with flaming gold, the clouds an oriflamme of fire. What a riot of scarlet! And the distant, barren porphyry mountains under the shadows in the east will light up in reflection with a mellow old-rose glow, while all the earth before you can only be described in the language of John the Divine in his vision on Patmos—"a sea of glass mingled with fire." You stand enthralled when the celestial artist saints spill all their paint adown the western sky. There is thaumaturgy in the air, for the changes at sunset are kaleidoscopic. Of course that diligent weaver, the sun, has been at work all day like a Navajo weaving a blanket, drawing skeins of color from the yellow sands of the desert. There is practically no vegetation on the floor of the Painted Desert, and thus the desert sends back the shining rays to the ambient air, as the shield of Elaine caught the first glimpse of the sunrise. To change the figure, all day long the sun-images are forming, and though during the day the mountain near you may have seemed a dull, burnt-over red, at sunset the images the sun has been forming all day appear as living spirits, and the same dull mountain changes to glowing red, then to topaz, to yellow, to cobalt blue, while the middle air has an opaline haze—all in a brief, small hour. And did you ever notice how the jagged desert mountains stand out like cameos in the sunset hour, while back of them is the golden haze?

The other day in the desert at sunset we saw the western sky take on a most ravishingly apple-green color, and we were not drinking hard cider, either, and there were no bubbles in our brain. This occurs only in the winter, and of course only in the desert; but you will mark that day with a white stone when you see it.

And the Afterglow!

Again the air is crowded with lilac, pink, red, yellow veiling, the colors depending on the shadows or the objects on which they fall. A great artist, an expert on colors, who traveled to Switzerland to see the alpenglow, said that it paled its ineffectual fires like a superannuated glow-worm before the afterglow in Arizona. There is an unrealized beauty in immensity and space, and you get it here, even though you cannot analyze it. Then comes the night; a violet blue, then back of a notch in the jagged mountains in the path of the departing sun is a slab of purest lapis lazuli; and then a deep purple robe is thrown over the mountains with the hush of night, just as in a great cathedral the majestic statues are clothed in purple garments before another joyful resurrection time. And thus all Nature mourns the death of day.

In a desert night the sky is lighted up with millions of stars. You did not know there were so many of them, and that they could be so wonderful. The stars do not snap and sparkle as they do in colder climes, but they outshine Canopus, and the Milky Way is swarming with millions of astral bees in glowing auriferous splendor. The distant white hills in the desert look like mounds of snow. How the soul snuggles closer to God in such a night, even as a child draws closer to his father.

A Handful of Indians the Only Inhabitants

And so we think that when the Lord God Almighty made the Painted Desert he made it because he wanted something beautiful to look at down on the earth. And we are sure that when the work was completed he not only said it was good, but very good. It is Nature's most wonderful and picturesque Oriental rug, for it has all of the color and beauty of one of these priceless objects, and it covers the country for miles. Four Indian tribes live in the Painted Desert—the Hopis, the Navajos, the Supais, and the Walapais—numbering all together in the thousands. They have reclaimed small parts of it, and are making what little patches they have to "blossom as the rose." As you look at some evidences of Indian cultivation farther in the

heart of the desert you feel that this would simply be the place to grow variegated corn, or those wonderful parti-colored chrysanthemums. Yet the amount of labor that the Indians put on the desert will never mar its looks, and it is destined to wear the same delightful face all the years. But let it be said that with these Indians of the Painted Desert dwell antiquities in architecture, social customs, and religion that might make ancient Egypt gasp and stare. Who knows but that possibly real antiquity is here, and not in Arabia and Egypt? It is just as good as a trip to the Orient.

Bury Your Troubles in the Desert

All that you see in any desert you see in the Painted Desert, and more. So if you are tired and weary and want a new thrill in life, if you really want to see something, and be born anew and get closer to God, pack up your troubles in your old kit-bag, and hike for the Painted Desert. Yes, bring your troubles along; for as soon as you get to the desert you will get to feeling so much better that the first thing you do is open up the old kit-bag and throw all your troubles away.

CHAPTER VI

The Petrified Forests of Arizona

THE Petrified Forests of Arizona near Adamana, on the main line of the Santa Fe Railroad, 150 miles east of the Grand Canyon, are the largest and most beautiful petrified forests in the world. If you doubt this, ask your Uncle Samuel, the tall, shrewd old gentleman with the hooked nose, waving goatee, beegum hat, spike-tailed coat, and star-spangled pants. He knows. He has been everywhere and seen everything on this line. And his army of highly trained experts and scientists are unanimous on this question. These are the only forests which show an abundance of color; the others are practically colorless, resembling bleached-out bones. But these are agatized—dreams in chalcedony. There are three forests, the First, Second, and Third (or Rainbow) Forest, called the Petrified Forest National Monument, and were set aside by proclamation by President Roosevelt on December 8, 1906. They cover over 25,000 acres, with hundreds of trees, some of them running over six feet in diameter and over one hundred feet long. Besides this, one of the most beautiful of all the forests, the Blue Forest, is not under government control; and neither is the North Forest, called the Sigilaria or Black Forest. So numerous are petrified trees in this region that it is estimated by government scientists that they cover in all over 90,000 acres, and it is believed that hundreds of trees still lie under ground; for it was below the surface hundreds of feet, some say thousands, that these trees lay, before they were washed up by the floods.

Nature Also Moves in a Mysterious Way

But the big thing that strikes you as you stand in the presence of these, the most beautiful agatized specimens of

petrified wood in the world, is the mighty working of Nature in all its mysterious moods. The story of these trees, for there is a big story, is one of the most fascinating in the world, and the work of petrification is something over which great scientists might spend a life of study.

We read recently in an old book a description of a mighty storm which swept over the land of Palestine years ago. This storm came out of the Mediterranean, swept southward in all its fury, and struck the forests of Lebanon. The storm is represented as being so furious that it broke down the tall cedars, hurtled them through the air, making them skip like a young calf, and then in the cloudburst that followed they were washed down to the lower country. We are told that something like this happened here. The scientists say that these trees did not grow on the site in which they were petrified. Up in what is now Canada, somewhere during the Triassic period, millions of years ago, these trees were, in a mighty convulsion of nature, thrown down. They are said to be an extinct species of the pine family, called, to be exact, Araucarioxylon Arizonicum.

Later—how long we do not know—they were floated down to where they were finally entombed and petrified. Now this process of petrification leads us to one of the most interesting studies in the world—even the formation of the desert; for the thing we want to impress on you is that this wonderful manifestation of nature's handiwork would not have been possible except in the desert. It took the desert to do this, and we do not mean peradventure. And so, just as when a great artist paints a picture he prepares a background for it, just so is the background for all this work the desert. You can neither understand nor appreciate these jeweled masterpieces of nature until you understand something about the desert. Not that you can understand all about it, for it is one of nature's great mysteries, but you can understand enough to give you an added appreciation.

Man Just at the Threshold of Nature's Secrets

Did you ever realize that the biggest part of the earth is a mystery? The inspired writer once spoke of the time

when heaven would swallow up the earth, and he said concerning that time, "There was no more sea." What did he mean by this? He meant that the unfathomable, mysterious sea was no more. The sea covered the most of the globe on which we live. The polar regions are still a matter of mystery, and of course the desert, which all over the globe covers millions of miles, is mysterious. We are just beginning to learn a little and extract a few secrets which have long been hidden in nature's learned breast. The secrets of this terrestrial ball and the universe above us are many; and when we get to know them we will literally be living in a new heaven and a new earth. You remember 'way back yonder, Job said, "Speak to the earth and it shall teach thee." And the earth has a good deal to tell us, for what does man know about the earth? What does he know about the winds, and the water-courses, the volcanoes in the very womb of the world? What does he know about the secret processes ever going on in the bowels of this mundane sphere? These are some of the questions you are going to ask yourself when you stand in the presence of these fallen, jeweled giants; for one fragment of these chalcedony mysteries will point you like a jeweled forefinger of God to an undiscovered wonder-world for you to conquer.

Primeval Battles of the Elements Staged in the Desert

For instance, there is the overpowering mystery of the desert where titanic forces battled at its birth. The desert was nature's Armageddon. Here the most terrific battles in the world were fought out, because it was a war waged by the elements. Here was a battle which would make the combined battles fought by man on this earth pale into insignificance. From the time of Abraham, when the five kings fought the four kings in Mesopotamia, through Thermopylæ, through the battles of Alexander, Scipio, and Hannibal, through Waterloo, Bull Run, Gettysburg, Verdun, the Argonne, the Somme—all of these rolled together could not equal in intensity the first phase of the battle fought here.

First, Old Ocean rolled remorselessly over the place, suffocating it to death, and then receded. The Sierras emerged as an insuperable barrier, and a pledge that the western waters would not again cover that part of the earth. The changes in the earth's surface due to the coming of the mountain ranges and the formation of highlands which cut off the western seas established drainage areas inland, modified the rainfall, and made possible excessive evaporation which dried up the immense water-courses, leaving only a succession of dying salt-lakes without outlet. These received the rivers which flowed into them; but even these rivers were rapidly wasted by evaporation. As these lakes and rivers totally evaporated in time they left no trace of their former habitation except a thick coating of salt, borax, sodium nitrate, and sodium carbonate—alkalis galore. These trees, soaked for centuries and waterlogged throughout, were left high and dry on the face of the desert with the recession of the ocean.

The Resistless Power of the Winds

Next the Sun sent down ten thousand times ten thousand mail-clad warriors armed with deadly weapons of fire. Then her ally, the Wind, unloosed all her terrific powers of destruction, and blew away the rain which had redeemed the land. There were no growing trees or grasses to hold the earth down, and Dame Nature used the four winds of heaven as her undertakers to bury these trees down in the graveclothes of clay and sand. If you doubt the winds could do this, all you have to do is to witness a sandstorm in the desert. We remember one evening in Tucumcari, New Mexico, which is only semi-desert, when we saw a sandstorm which convinced us that the wind could do anything in the desert. When the North Wind unleashed her fury she picked the sands of the desert up and moved them in a swift, advancing, rotating column which seemed to be over a hundred feet high. The air was full of sand so thick that you could not see across the street. And so the winds of the desert, strong and powerful as an army of giants, picked up the sand to be the winding-sheet of the trees. Then in the process of the years they were

covered either by the wind or by certain geological changes with a thick coating of limestone hundreds of feet deep, and then there was a thick, hard capping of red sandstone until they were more than 700 feet below the surface.

Rivers Turned Topsy-Turvy

Someone has said that when the Lord made some of the rivers in Arizona he made them upside down, with the bed of the river on top of the earth and the waters at the bottom. This was just exactly what was needed to do the work of petrification, and, as we said before, nowhere else on the globe does this condition exist so well as in the desert. Here Nature provided in these underground rivers and in the chemicals found in the desert and in the pressure of the earth above the proper ingredients and machinery for doing the job. The first thing needed was silica, for petrification is produced by the infiltration of water containing dissolved mineral matter such as calcium carbonate and silica, or sand, which replaces the organic material, particle by particle. Now, in petrification silica gives the most perfect results, and that is where the desert comes in for the reason that silica is insoluble in water, but is readily soluble in an alkaline wash. So you can see how the desert, with a highly alkaline bed left there by Old Ocean, would do a perfect work.

The Alchemy of Color-Making

To produce the beautiful colors, and you see such colors nowhere else on earth, solutions of manganese and iron had to be added to the silica; and in some mysterious way these were extracted from the bowels of the desert mountains and were driven into the very heart of the trees by Nature's jeweled dagger. The next thing needed was pressure. In no other place except the desert could the proper conditions obtain, for it took a thick covering of earth which only the shifting sands of the desert supply, gradually accumulating, and then held down by limestone and a sandstone capping. To drive creosote into the soft heart of a pine crosstie a pressure of 250 pounds per square inch is exerted; but this is accomplished as easily as a great gob of ink will go

from a leaky fountain pen and penetrate the porous fiber of your white shirtfront, when you compare it with the age-long pressure which these trees endured, having 700 feet, some say 2,000, of sand and stone bearing down heavily upon them through uncounted millenniums.

You get some notion of this enormous pressure when you see these immense trees, some of them hundreds of feet long and six or seven feet in diameter, with a lopsided trunk, squeezed out of all proportion. It took force—intense, unrealized force—for Nature to make immense translucent jewels out of these fallen monarchs of the forest.

When we see these prone trees we cannot but liken the Petrified Forest to the Taj Mahal in ruins. Imagine that most wonderful specimen of the architect's art, which stands like a solidified poem on the banks of the Jumna, fallen to the ground, its polished columns, golden fanes, and jewel-incrusted walls, all lying prone. Imagine not one Taj but a hundred of them—yes, a thousand of them—and you begin to get an idea of the scene that awaits you out in the desert of Arizona where the Petrified Forests are in all their glory.

The Blue Forest Foremost in Beauty

As stated previously, there are five forests in all: First, Second, Third or Rainbow, the Sigilaria or Black Forest, and the Blue Forest. We will consider them in the order we visited them. First, the Blue Forest: This is considered by some to be the most beautiful of all the forests. It is the smallest, but it has a soft, refined beauty which is restful to the soul. Some years ago we stood in the Blue Room of the White House, and amid the luxurious surroundings there, and with all of its historical associations coming before us, we felt the beauty and the thrill of it all. But the Blue Petrified Forest, Nature's Blue Room, makes this other room seem tawdry and cheap. The poet tells us that the groves were God's first temples, but we are inclined to believe that the Blue Forest was his first and greatest temple. Somehow or other we cannot get out of our mind the relation of the color scheme here to a great church. Compare this entrancing blue with the blue coloring used in the

ancient Hebrew tabernacle and temple, where it had a symbolic value, for the color sense of the ancient Hebrews did have a religious direction. We are told that blue was used for the curtains of the tabernacle, the veil of the ark, the screen of the tent door. It connected the sacred Ephod, the precious divining-jewels of the high priest; it formed his miter, and his girdle; it was the sole color of his beautiful, enveloping robe which was woven without a seam. It was the covering of the golden altar, the table of shewbread, the seven-branched candlesticks, and the vessels of the sanctuary. It was the color of the most sacred veil of the Holiest Place in Solomon's Temple, which veil was rent at the crucifixion of our Lord. In Ezekiel's description of the luxury of Tyre he tells of the blue awnings of their ships, and the veils of blue in their merchandise. Purple is for royalty, but blue is for the use of humanity, to induce the spirit of worship, and for quiet magnificence. And that is what we were thinking of when we stood amid this soft splendor.

Blues in Bewildering Profusion

You see a suggestion of all the blues in this forest. There are touches of cobalt blue, cerulean blue, royal blue, Saxon blue, Hungary blue, Paris blue, Prussian blue and azure; but the prevailing color is a soft, delicate, refined but entrancing shade of hyacinth blue.

Another thing that makes the Blue Forest so beautiful is the fantastically carved hills and escarpments. We see here the handiwork of nature as a sculptor, and the fancifully carved beautiful blue hills stretching out on every side seem like high altars for worship in a great temple filled with heroic statuary. John Muir claimed that he discovered the Blue Forest, although the other forests were first seen by the white man in 1853. Besides the Blue Forest there are the First, Second, and Third (or Rainbow) Forests, which are included in the Petrified Forest National Monument. These make nearly 26,000 acres, and it is estimated that there are over one-half million tons of petrified wood in the Monument. Of course there used to be a great deal more than that, but the Indians knew of these wonders long before

the white man ever dreamed of them, and they carried out the smaller parts of the trees to make hatchets, chisels, arrowheads, and even to build their houses; for in the forests there are ancient Indian houses made of petrified wood.

Nature as a Sculptor

The First Forest, besides containing a good deposit of petrified logs, has some interesting rock formations. Some aërial statuary entices the vision. The wind and the rain took liberties with the yielding carbonate of lime, and carved counterfeit presentments of things earthly. For instance, there is the Eagle's Nest, and the Snow Lady, the latter reminding us, somehow, of Lot's wife, who changed from flesh and blood into a white heap of sodium chloride near the cities of the plain. Here in places the logs are as thick as a busy and well-stocked wood-yard, and the surrounding hills show their proximity to the Painted Desert by their stratified bands of vivid coloring.

The Second Forest is two and a half miles south of the First Forest, and runs to about 2,000 acres. The trees here are much larger than in the First Forest. In this forest also are found in the trees a good many amethysts and smoky topazes. These beautiful, crystalline gems are really petrified resin from the very heart of the tree. The topaz is near the diamond in hardness, and is of rare beauty when found in these trees. So highly prized are they that years ago men used to use dynamite trying to blast these trees to pieces to get at the precious jewels at the heart. This accounts for a good many of the chips that litter up parts of all the forests, making the desert floor look like a wood-yard after a hard day's work.

Nature as a Bridge-Builder

In the cut shown in this article we have a picture of the natural bridge, which is a large petrified tree 60 feet long, spanning a canyon 45 feet wide and about 25 feet deep. You can easily walk across on it. This tree furnishes a striking example of how trees broke into cross sections. It was originally over a hundred feet long, and probably worked as a dam for the waters. As it was buried in lime-

Trees in Petrified Forest.

stone the waters gradually undermined the earth below the top end of it, and the tree sagged and broke. The erosion was so great also under the middle section that finally the canyon we mentioned above was formed. In order to keep this log from further breaking the government has placed concrete pilasters under it. In the Second Forest there is a huge section of a petrified tree probably twenty feet long and about four feet in diameter, held up by a column of limestone which rises out of the floor of a much-eroded waterway about fifteen feet high. It looks for all the world, as you glance at it from the plateau above, like a huge teeter-board. But the escarpments in this waterway give you at a glance a well-defined notion of how the resurrection of these trees was accomplished.

Rainbow Forest Runs the Gamut of Color Display

The Third, or Rainbow, Forest is the largest of the lot. It covers several thousand acres, and there are several hundred whole trees which run to great lengths, some of them more than two hundred feet long. This is the most beautiful of all the forests for variety and vividness of coloring. No mistake was made when they called it the Rainbow Forest, for it has all the colors of the rainbow: red, orange, yellow, blue, indigo, green, and violet. It also has a profusion of black, the black and the green coloring reminding you of the coloring of the Painted Desert.

I must confess that I was not prepared for the surprise that awaited me when I stepped into two marvels right at once—the Sigilaria, or Black Forest, and the approach to the Painted Desert. The ground in which the Black Forest is located is the most wonderful shade of olive green we have ever seen, for this is the approach to the beautiful shades of the desert. Just a word as to the Black Forest: Here the trees went through the same process of petrification that the trees a few miles away in the Agatized Forests, the First, Second, and Third, went through, with this difference, however, that the trees in the Agatized Forests are all said to be a species of pine now extinct; while in the North, or Black Forest, there was possibly some mixture, palms and pines, and here petrification was accomplished

in the Carboniferous age. Another point of difference: In the Agatized Forests you are struck by the variety and richness of color, until you could imagine you were in a great jewel factory in the process of making. Here you feel that you are in a forest of mahogany, only the delicate, hairline tracery of the most wonderful ferns in the world show that in some far-off age a celestial giant artist left his "stamp of the fern" on the side of a giant palm or pine.

A Forest Floor Laid in Old Rose

In the First, Second, Rainbow, and Blue Forests you find the floor of the desert here and there covered with what at a distance seems to be an enormous field of cloth of old rose. When you get nearer you find that these are coral beds, and these beautiful, tender forms are shaped like small rosebuds colored a delicate shade of old rose. An interesting feature here is found in these fossilized corals. Besides silica, siderite, iron pyrites, iron oxide, and dolomite are petrifying agents, not as good as silica in replacing cellulose matter; but coral, being a calcareous secretion of marine invertebrate life, any of these would join with it more easily than silica. No doubt of it, this was nature's great pickling vat, produced in collaboration between the sea working first, and then the desert. And what a vivid reminder these corals are of the one-time presence of the ocean.

Vandalism of Tourists

The scientists say that these trees had no branches and no bark; the great distance they had to travel through the troubled, turbulent waters destroyed the branches and ground off the bark. To a lay mind if these trees have no bark, they have something which is a pretty fine imitation of bark. Now, as to roots, the Blue Forest seems to have a good many; and as to branches, people who have lived near the forests a lifetime say that for more than half a century the branches have been carried out in wholesale lots by visitors, for the white man first saw what is called the First, Second, and Rainbow Forests in 1853—the Blue and the Black Forests being discovered later. The wood

is so heavy that a person who wanted to take a souvenir would, of course, take the smallest thing he could carry, which in many cases would be a branch. That may be one reason why the scientists, who came late on the scene, found no branches. As soon as the white man found out the wonderful value of this wood be began to exploit it commercially. Some Babbitts who had no sense of the beautiful, and who carried their souls in their money-bags, went in and shipped out thousands of tons, carloads of it, to the East to be made into table-tops and other household ornaments. Others with a soul even smaller than the Babbitts, if such a thing is possible, found that the wood was harder than carborundum, and they brought in machines to grind it up to use for polishing purposes. They had shipped out a great deal of it when President Roosevelt heard of it. He had seen the forests and was carried away with their beauty; so, acting with his usual vigor and promptness, he chased out these malevolent marauders, and made the forests a National Monument. Now no one is allowed to take wood out of the Monument, although they may take specimens which lie on the outside. However, all this vast acreage under government control is patrolled by only one ranger, which you recognize readily as an impossible task. The able and courteous custodian in charge, Mr. William Cox Buehler, should have more men to watch the Forests to see that these precious specimens are not carried away.

Human Sculptures Crumble, But God's Endure

In the Petrified Forests God built in enduring stone. The Parthenon is a wreck; the Pantheon is a ruin; the heroic marbles of the great Greek sculptors suffered horrible disfigurement; the Nike, or Winged Victory of Samothrace, is headless, and the Olympian Jove of Phidias has crumbled into dust; while hundreds of other marble masterpieces of the great Greek sculptors are broken into bits, gnawed hollow by the remorseless tooth of Time, and even their memories have gone glimmering through the dream of things that were. Then consider that these trees were made in Nature's laboratory millions of years ago, and still hold

their pristine glory, while the works of the Greek sculptors have vanished which were but as yesterday. Not only the Word of God, but the works of the Lord endure forever.

And the colors! When it comes to colors, you can leave it to Nature; you will have an infinite variety that you cannot catalogue. So multitudinous are the colors in these stone jewels that it would take a genius in coloring, like Corot, to count them; and then he would need an adding machine and a table of logarithms to help him out; for all the primary colors are there, and then all the combinations of shade it is possible for the primary colors to effect. In fact, the color scheme in the Petrified Forests runs the whole chromatic gamut. God made the coloring in the Petrified Forests very beautiful, really extremely beautiful, and we imagine he did it just as a great artist will paint his best and most perfect picture to please himself. No earthly artist ever had such luck with his coloring in making it stick. Talk about "fast colors"—this is the only place in the world you can find that rare article. The artist Titian was a wizard in colors. His reds ravished the soul of the layman, and caused rival artists to bite their nails and chew their whiskers trying to suppress their envy. He was just that good with reds that he caused the name "Titian" to pass into the language. He painted in the sixteenth century. But these entrancing reds had hardly been on the canvas when, it is said, they began to turn dark; just as the hennaed hair of the brunette lady, who receives the confidential information that gentlemen, somehow, prefer blondes, does.

God's Great Palette of Unfading Colors

Even the paintings of Sir Joshua Reynolds, who was an expert on mixing colors, and who said he had such success because he mixed his pigments with his brain, are all the worse for wear as the years go by. The remorseless sunlight takes the bloom out of the rosy, damask cheeks of his ladies fair, making them seem a deathly white; while it has turned some of his deepest blues to the complexion of skim-milk. This is what the sun and the atmosphere will do with man's best stuff, even when he takes the

utmost precaution to house them well and protect them.

But here these trees out in the intense sunlight for hundreds—yes thousands, perhaps millions—of years, out in the open desert where there is not a particle of protection, where the rains descend in torrents, in cloudbursts, where the snow falls, where the frosts of winter try to crack and congeal, where the heat of summer is intense, where the wind blows a hurricane and directs a terrific sandblast against them, and where the oxygen of the air will eat up a steel spike in time as easily as a boy eats a stick of peppermint candy—out in all of this they have retained their coloring, and are just as good as the day when they first saw the sunlight. In fact they are never more beautiful, and the colors are never more vivid, than they are after a rain has just fallen on them.

Now try that on a man-made picture.

The breastplate of the Jewish high priest must have been a beautiful thing with its twelve gems, three in a row, each gem or aggregation of particular jewels big enough to inscribe the Hebrew names of the twelve tribes on them. Set in order they were: Cornelian, Reuben; Topaz, Simeon; Emerald, Levi; Ruby, Judah; Sapphire, Issachar; Diamond, Zebulon; Hyacinth, Dan; Agate, Naphtali; Amethyst, Gad; Crysolite, Asher; Sardonyx, Joseph; Jasper, Benjamin. No wonder the writer of the Apocrypha raved over the appearance of the Maccabean high priest as he went into the Holy Place. Think of assembling an aggregation of these jewels in such proximity to each other that they covered a man's breast. But even this ravishing sight was not greater than that presented by this wood when it is polished.

There Is Nothing Like It in All the World

You can always depend on Nature to do her perfect work. Man brings forth no fruit to perfection. No matter how good it is, it is always subject to improvement, but when Nature does anything she does it right. Therefore she alone can rightly subscribe "Finis" at the end. There is not a particle, not an infinitesimal atom—nay, not even an electron—of these trees that was overlooked in the petri-

fying process. And how hard these translucent quartz giants became! They are like unto precious stones in their hardness. According to the standard scale of jewel hardness the diamond registers ten points—the highest—the topaz is eight, and this wood is nine—right next to the diamond. It requires diamond dust to polish it; but when it is polished—oh, the beauty of it!

This diamond-like hardness explains why these trees broke so evenly and cleanly in cross sections when the waters and the wind cut the dirt from under them and they sagged and fell; or when the frosts of a million winters got in their cleaving work, and finally drove into even the slightest crevice an expanding wedge of ice.

Buried as Bodies of Common Wood, Resurrected as Resplendent Jewels

It is said that these trees were all buried headed toward the south. We trust that no one believes for a moment that they were petrified standing up. You can see at a glance that this would be manifestly impossible; they would be so top-heavy that they would fall of their own weight. It is true that there are some stumps of standing trees in the Yellowstone, but they are only stumps, and are few and far between. These trees were petrified 'way under ground, as pointed out previously, some placing the distance below the earth at 700 feet, and some saying it was several thousand. As we are neither a scientist, nor a son of a scientist, but merely an appreciative observer, we will pass that question on. But there is no question about it: that it took place a long way under ground. After a while the water and the wind uncovered them, just as the wind had formerly buried them, and there was a glorious resurrection. The sands had been the shroud of a body terrestrial, and the shroud and the body had been converted into a form celestial. They were sown a natural body of common cellulose; they were raised a spiritual body of chalcedony, opals, agates, and amethysts. They were sown in weakness, but they were raised in power. They were sown in corruption, but they were raised to an incorruptible immortality; for when the last man has passed from earth, when the heavens

have shriveled like an ancient parchment, when the sands of the desert are cold, when the last trump has sounded, they will be just as beautiful and just as wonderful as they were on their resurrection morning.

How to Find Them

You will miss half your life unless you see them. Get off the Santa Fe at Adamana, Arizona, go to the Forest Home Hotel, where you will find a good place to stay and where a competent guide who knows the forest, who has lived there all his life, will take you out in a closed car.

CHAPTER VII

Indian Picture Writing

Indian Picture Writings in the Painted Desert and the Petrified Forests of Arizona

IN the beautiful Library of Congress at Washington there are six mural paintings that wonderfully illustrate the suggestive theme, "The Evolution of the Book."

Evolution of Graphic Expression

The first painting is called "Oral Narrative," and represents a Bedouin Arab preaching to a crowd of Arabs seated on the sands of the desert. The speaker is clothed in a white, flowing robe, with a staff in his left hand, and his right hand extended in a gesture in true preacher fashion. He is telling a story, and in that time that was the only way in which one mind communicated with another.

The second mural in the series represents two men clothed in skins of wild animals, who were building a cairn with a pile of loose, unhewn bowlders. Some great event had happened, and this was their silent but effective way of telling about it; just as the Greeks after Thermopylæ put together stones at the famous pass to commemorate the heroic act of their people. The cairn is the great-great-grandfather of all our monuments and statues. Because these men built the cairn, even to-day we build symbolic monuments to commemorate some great event, or we erect a statue to some great hero, which tells in silent speech the story of collective or personal achievement.

The third mural shows an evolution indeed. An Egyptian seated on a scaffold is seen carving hieroglyphics on the side of a mountain. It is a big step in the history of the race when some gifted genius conceived the idea of using

the ideograph to tell the story, instead of resorting to an immense pile of bulky stones. We have never seen the full import of this event. It was a great day for the world when Fulton discovered that steam could move a little boat better than sails. Someone said that by means of steam man realized the fable of Æolus' bag, and kept the four and forty winds in the boiler of his boat. It was a great day for the world when at Kitty Hawk, N. C., the Wright brothers discovered that it was possible to use a heavier-than-air machine, and fly. But it was equally as great a day for the race when that unknown genius discovered writing in symbols, and was thus able to tell the story in a new way.

Indian Picture Writing

The fourth picture represents an American Indian writing the story of the chase on a buffalo hide. Having traveled extensively all over Southwestern Arizona and part of New Mexico, we have often longed for some paint manufacturer to get out into the Southwestern Desert and discover the secret of the paint the Indians used in their writings on the side of the cliffs and on the rocks. In the Grand Canyon, near the beginning of the Bright Angel Trail, years and years ago some Indian tribe depicted a scene of their life on the canyon side in red paint. Anyone who has been to the canyon knows that the wind blows a regular hurricane there, and that the wind uses the sand of the surrounding desert as a kind of sandblast against the canyon wall. It rains great guns, while in the summer time the heat of the sun is intense. In spite of all this, the paint put there by the primitive Indians remains intact. O, that we had a paint manufacturer to turn out such an article!

The fifth mural represents an ancient monk copying a manuscript, while the sixth represents Gutenberg reading the first proof ever taken from the press, printed by movable type. This was in Germany in 1450. The old screw-type of handpress is in the background, while in the foreground Gutenberg, in flowing robes and with a flowing white beard, is holding a large sheet of white paper before him, his eyes wide open with astonishment as he looks at the

magic proof. That fellow carving his hieroglyphics on the rock, putting a whole sentence into a few figures, has a most vital connection with Gutenberg; which brings us to the point of our story.

Not only in New Mexico and Arizona, but throughout most of the far West, hieroglyphics, or, as the natives call them, "Indian picture writing," can be seen. In the Painted Desert in Arizona, and in several places in the Sonora Desert, we have seen the connection between the man on the scaffold and our American Indian.

Suggestions for New Designs

Some time ago we met in the Painted Desert, about 150 miles east of the Grand Canyon, on the main line of the Santa Fe Railroad, a tall, thin Frenchman, who was a commercial artist in New York City. His business was to draw original designs for household decorative purposes: furniture, crockery, etc. He had had an attack of pneumonia, and his physicians ordered him to stay six weeks in the dry climate of Arizona. To revise an old saying, he came to cough, but remained to prey, in a perfectly legitimate way, however, on the Indian writings. He found the picture writings near the Painted Desert so full of suggestions that instead of staying six weeks he stayed six months; and then only with reluctance tore himself away, with his bodily health renewed, his notebook full of ideas, and his conception of Indian life completely revolutionized; for the symbols, all of them unknown to the white man—certain angles, curves, and spirals—were something an artist would revel in.

It certainly required someone who had the cosmic artistic urge to carve on the hard rocks some of the pictures they made, and to do it with the instruments they had. The Indians in the Painted Desert most likely used a piece of petrified wood for a chisel and another for a hammer. These pictures have not the delicate lines of Fra Angelico, or the artistic nuances of Whistler, but the man who carved them was, under the skin, a blood brother—artistically speaking—of Rembrandt van Ryn, who carved such artistic warts on the chins plural of corpulent Dutch burgomasters.

We admire him (we mean the Indian, as well as Rembrandt), for with the tools he had and the object he had to work on we could not do as well. We are very much like the nouveau riche contractor, who, when asked if he could draw an inference, replied that he could, provided his trace-chains didn't break. We can draw a straight line, provided we have a ruler, and somebody holds the ruler while we put our tongue between our teeth and use the pencil with both hands.

Now, these untutored Brothers in Red took their crude tools and carved stories on the rocks. We doubt not but that one of them was a poet as well as an artist, for in the Painted Desert there is the story of a courtship and marriage; possibly his own, possibly that of his chief. However, contrasting this with the warlike scenes which usually abound, the description of battles, the description of the chase, the war dances, the story of drought and hard times, we must conclude that the man who spent days carving the story of a courtship on the hard granite rock was some poet, even if he did express it in pictures.

Writing Poetry under Difficulties

The picture shown in this article represents the Indian writing, or Petroglyphs, found at the edge of the Petrified Forest near Adamana, Arizona, which is on the main line of the Santa Fe. The rocks in this immediate vicinity are covered with Petroglyphs carved by the Indian dwellers in this section. They are unusually good. We have seen Petroglyphs all over the West, and they exist only in the desert section of the great Southwest. In most cases they were not carved very deep in the rock, and the wind and the rain and the sandblast of the desert are wearing them away. The tools they had were not so good; possibly the hammer and chisel were made of ordinary stone in most instances, so they did not cut very deep into the granitic face of the rocks. But here they fortunately had something harder than granite, something as hard as carborundum—petrified wood—and with a hammer and chisel made of this hard substance they cut deep into the rocks. One picture carved on the rocks here is not seen elsewhere, and

Petroglyphs or Indian Picture Writing.

those interested in Indian lore travel from all over the country to the Petrified Forest just to see it. You remember the story of a little girl living in the East Side of New York City who was asked by a teacher what a Stoic was. She replied in true East Side accent, "A Stoic is a bird wot brings the babies." They have here, strange to relate, a stork holding an Indian baby in his bill. And thus they celebrated the birth of some youngster.

Claims Kinship with the Rattlesnake

Other interesting pictures on these rocks are: a flock of mountain goats with their herder, the long horns typical of the mountain goat, and the thin bodies telling the story of a time when domestic animals were very scarce. The snake appears wherever there is any picture writing. Perhaps some priest carved this, for the snake to-day even is an indispensable adjunct of religious worship; and in the Hopi Indian dance, which takes place every August in the Painted Desert, the rattlesnake is affectionately termed "little brother," and is sent out with prayers to the Indian god of rain tied about him as a mute petition for rain. On the other hand, it is contended that the snake merely means that some member of the Snake tribe passed that way. And here is an interesting study. Travelers in all sections of the country have noted the hobo signs which "decorate" box cars, railroad stations, barns, fences, etc., showing that some hobo passed that way, giving the date and an arrow showing which way he was traveling. A No. 1, the Texas Kid, the Chi. Red, and others, following the lead of their Middle Age confreres, for you can find references to the same symbolic writings in the history of the Middle Ages, all adopt this means of communicating with their kind. It is likely that the American Indian, who isn't so blank after all, adopted this means of communicating with his tribe. The Indian has ever been a rover, and perhaps there were even Indian "hoboes." Another picture often seen is the spiral, which some contend represents the number of years the event it is placed with lasted. If it is placed near a battle, it means that the battle lasted that many years; if it is placed near vertical strokes, it means, perhaps, that a

drought lasted that long. However, we are not dogmatic about this, and there is nothing about the writings concerning which we can be too certain.

Had the Aztecs an Egyptian Ancestry?

Perhaps the day will come when some genius who has given his life to the study of the American Indian and all that concerns him will do what Professor Breasted, Professor Rawlinson, and others have done for the cuneiform writings of the people of the East. The man who does it will have an interesting work, one which we would almost envy him; for if we could do it there is nothing we would rather do than to spend our life studying that fascinating history the Indians wrote all over the rocks of the Southwest. Here is something which will open a new world; and to be able to picture these American shores as they once existed will be more than startling. Where did the Indian get his knowledge? Was it from Egypt? We do not know. But perhaps some day we shall; and then we shall revel again in an interesting period of our American history.

However, it is interesting to note that some scientists say there is a connection between the ancient Egyptians and the American Indians. They based their conclusions on the fact that they are struck with the great similarity between Egyptian and Aztec architecture and religious rites. Besides, anthropologists have detected certain ethnic resemblances. These men say that in the early days this continent was joined to Asia by land, and they crossed over by Behring Strait, making a long trek from Egypt to this country. In the Casa Grande ruins in Arizona there is on the wall of a communal house built by the ancient Indians a representation of an eight-chambered labyrinth, which indubitably came from the Old World. It came from ancient Crete, and possibly started in Egypt; but how did it get here? That is the question; and it opens up an interesting field for speculation. The more you study the American Indian, and especially the Indian writings, the more you are convinced of his antiquity; and you feel that a race almost as old as the Egyptian, possibly transplanted Egyp-

tian, existed on these shores. Is it any wonder that people should be tremendously interested in our great Southwest, in the deserts of Arizona and New Mexico, which was the cradle of humanity on this continent?

CHAPTER VIII

Hopi Indian Architecture—and Else

IT was on the occasion of my first visit to the Grand Canyon of the Colorado in Arizona, several years ago, that I first saw the Hopi Indians; and from that day to this there has been with me an increasing interest in these, the strangest of Indian tribes.

Every visitor to the Grand Canyon, as he stands at the steps of the El Tovar Hotel and looks across the thirteen miles that separate one edge of the canyon from the other, will notice at his side a remarkable building—remarkable because, although he may have seen hundreds of times a picture of a building like this, he has never before, especially if he is from the East, seen anything like it in real life. It is the Hopi House; and architecturally it is the concrete present-day manifestation of a period of life so far back that its beginnings are obscured in clouds of mystery; for the Hopi House is the present-day successor of the old Pueblo buildings, and also it is only once removed from the cliff dwellings.

Genealogical Speculations

Some of the ethnologists say that the Hopis are the descendants of the Cliff Dwellers; others say that they came from the canyons of the North, and others that they are a mixture, not only of the Cliff Dwellers but of Indian tribes from the four points of the compass. Major Powell said that linguistically they were related to the Shoshone, and that they are cousin-german, or cousin-Indian, or half-brother, or whatever you want to call it, to certain Indian tribes stretching all the way from the middle of Idaho to Old Mexico, including among others the Digger of California and the Comanche of Oklahoma. Personally I am

inclined to think that, although they are now muchly mixed through intermarriage, originally they were the descendants of the Cliff Dwellers; and I might add that this conjecture sheds the only ray of light on the most-debated of problems of the Indian's prehistoric life, the question, "Who are the Cliff Dwellers, and what became of them?" Certainly there does seem to be something in common between the ancient Cliff Dwellers and the present-day Hopis in architecture and religious symbolism.

The Hopi House and Its Exterior Embellishments

This Hopi House at the canyon is a faithful reminder of the pictures you have seen of the old Pueblo buildings. It is three stories high, built in terraces, has an entry on the roof, and, instead of a stairway has the inevitable ladder. It is said that if you go into any of the villages of the Hopi Heptopolis in the Painted Desert, Tewa or Hano, Sichumovi, Walpi, Mishongnovi and Shipaulovi, Shumopovi and Oraibi, you will find the buildings there just as you find this one at the canyon. Take Oraibi, which is one of these towns, and the westernmost of all the old pueblos, as Taos is the easternmost. Oraibi is in the same place to-day as it was in 1540 when Coronado and his Conquistadores came to this province of Tusayan. There the houses in this town of over a thousand people are very much like this house at the canyon—terraced, three stories, a ladder reaching from story to story, and from the "blockhouse" on the very top a ladder reaching out and then extending downward into the kiva, the underground secret chamber, a place of worship or preparation for worship, a sacred place to the Hopis when religious ceremonials are on. On his native heath the Hopi flings out his banner to the sky from the housetop. He lets the world know he is not busted by hanging out his groceries on the side of one of the terraces. It is a sign to the wolf-of-want who sniffs around the door of poor folks that he needn't come around. If he has goat meat for supper, he lets the neighbors know it, and it is real striking to see a row of red ancho chilis, red peppers, tied on a string and decorating the white background of the side of the house, burning like a blazing

The Hopi House, Grand Canyon

gonfalon. To me it is a picture, a pretty picture, these red spurts of flame against the white adobe outer walls. If I were an artist, I would paint this as sure as the world.

You may not be able to take the long and expensive, though fascinating, trip to the Hopi cities in the Painted Desert, but you can get a good glimpse of Hopiland here in viewing this house and the inhabitants.

House Building a Feminist Movement Strictly

Strange as it may read to some, the Hopi houses were built like present-day "flats," housing often a dozen families, and were, following the cliff dwellings, the first "apartment houses" this country ever saw, thus being hundreds of years ahead of even our own progressive architects. Solomon was right—there's nothing new under the sun.

A curious social law of Indian life is bound up in the building of these houses. The women own the houses and build them themselves. From time immemorial when the women of the families who have agreed to build a house in common get together to discuss ways and means, until the time the last detail is completed, it is strictly a feminist movement. The women carry the adobe clay from the bed of the nearest water-course in tubs and buckets, and often the nearest water-course is miles away from the "heights" where the houses are always built. The women then make and sun-dry the bricks, carry the "hods," place the bricks, do all the necessary work—even to the placing of heavy rafter-beams—and then they do the plastering and the interior decorating of the rooms and halls, usually in the most weird and barbaric colors, often decorating them with Indian picture-writing, or drawing the most intricate geometrical designs. It is said that almost invariably when the good ladies of an Indian pueblo decide to build a house, all of the men of the pueblo decide to take a little walk to a foreign hunting-ground, the foreigner the better, and they stay away until they are quite sure the tinting is perfectly dry. They seem to reason that if the ladies own the homes it is only fair enough that they should build them. Hunting is a man's job, anyhow. We have never heard an

Indian sing anything but those weird, chanting Indian songs; but it is safe to say that if ever they did sing our songs it would be like the Hopis to select that highly syncopated song in much vogue some years ago, "Let the women do the work, and the men the gad-about." As far as the building trade is concerned, we are sure the Hopis would.

It is safe to assume that from the way the women own all the property, rule the house, and boss in all the important economic things in the tribal life, if the Hopis ever have a government of their own, it won't be the women who will be carrying banners and pleading for the vote; but the Hopi Men's Equal Rights Club, gathered from the Hopi Heptopolis in the Painted Desert, will be picketing, if they dast, the "White House" of the main Pueblo.

The Hopi Man Has His Worries

It must not be thought from this that the Hopi man of the family has nothing to do till to-morrow. In many ways he is a hard worker, even if he does not build the house. He has to keep the pot boiling, supply the wherewithal of the eats, and this is no child's play out there in the desert where he has a limited amount—very limited—of water, and where he has to extract a living out of the hard, remorseless, resisting heart of the desert, which yields readily to nothing save plenty of water; and to fight the ever-shifting desert sands, which are troubled like the waves of the sea and cannot rest; and then to fight off the starved-out birds who would eat his seed as soon as he puts it in the ground. The Hopi is a farmer and a hard worker in the fields; he has to be if he intends to get a crop at all. Early in the spring he starts his primitive plowing, and with his digging stick he goes deep into the ground, for he must practice "almost-dry" farming. Then, as before stated, when the blade of grain first appears he must keep the sand from choking it, and club in hand he must fight off the jack rabbits and the crows. He has to do this for his garden truck, his melons, and his fruit trees. It is just one thing after another to get a living out of the soil.

Also, Has Freedom from Other Worries

And while he never has to worry like his white brother who is speculating in the farming business, and worrying and fearing as to what Congress isn't going to do, or, worse still, what it might do; yet he has his worries in plenty, being an honest agriculturist. He has to see the crop through from the first minute it is placed in the ground until it is harvested. At that, he is better off than his white brother, for he is sufficient unto himself. He raises all that he eats—and that is no mean job; most of us would starve to death if we had to do that. He raises nearly everything he wears, since he has a flock of sheep; and the women have not forgotten how to work and to weave clothing and blankets; so, you see how scarcely "high society" has affected them. He never worries about the gas company shutting off the gas because of an unpaid bill, for he goes out and cuts his fuel supply in the mountain forests of pine and cedar, and hauls it in, often for miles. He has no telephone bill, and apparently not being able to have a friend "give him a ring" does not worry him in the least. There are no installment collectors ready to take the new radio away, no book agents, and no newspaper subscription solicitors—for if anything important happens that the Hopi ought to know he is right there in the midst of it, and probably had a hand in making the news. So you see he has some compensations. In addition to his other work some of the men are real artists when it comes to pottery and blanket- and basket-weaving.

But as interesting as the Hopi House at the Canyon is from the outside it is equally as interesting from the inside. Here at the Canyon the Navajos share a part of the ground floor with the Hopis. The building is a veritable treasure-house of Indian art. The Navajos make the most wonderful of Indian blankets, and work in silver; the Hopis work in weaving baskets, ceremonial robes, blankets, and in making pottery. Everything is doubly interesting because of its superior craftsmanship, and also because it is accomplished by the most primitive means.

The Temptations of Affluence

We never think about being rich, but whenever we go into the Hopi House we wish we were; not that the prices there are high, for you get full value for little money, but we would like to buy everything in the place. The silver filigree work, the pottery, the polished jewels, the baskets, and the blankets all fascinate us. Buying Indian blankets, for instance, is risky business for the man who knows nothing about them. It is all what you might call "Blue Sky" business, and akin to betting on the races, investing in oil and mining stock, gambling in futures, buying on a margin, being served chicken pie, which is a gastronomic lottery, selecting a watermelon—or getting married—you are not so worse off so long as you're lucky. But if you are not lucky, the fellow who sells you a blanket on the outside—you will probably never see him again—has the edge on you, and the middle and the sides also, and you are likely to be in the position of the man who sticks his finger into a hornets' nest to see if these concentrated, dynamic, yellow perils are still conducting business at the old stand. The answer is indubitable and hot-pointed—"stung." But here at the Hopi House you know you are dealing with a responsible set of people who will always be doing business at the same stand, and you may rest in the assurance that whatever they tell you is just that way. This has always been our experience, and applies to all the Harvey Houses. And so we always feel that it would be fine to have for once all the money we wanted whenever we look on the bales of Oriental-like treasures. The originality of design, coloring, material, and then the honest work, is not only refreshing but actually intriguing in this day of imitation and inanity, slipshod and shoddy.

Dancing a Serious Business

But a larger affair which takes place in this house must receive our consideration, because it stretches so far back into the past history. We refer to the Indian dances which occur nightly in the Hopi House. As a boy we had seen the Cherokees, the Choctaws, and some Kickapoo Indians

dance. Most of this dancing was done in medicine shows, and the dancing was merely the curtain-raiser to introduce the super-important and mysterious man of the drooping, black, walrus mustache, beegum hat, flowered vest, blazing diamond horseshoe stickpin bigger than your thumb, sticking in a lurid red necktie, with loud-checkered suit—and career, basso profundo voice and ptomaine breath, who was selling "the greatest medicine on earth, good for all human aches and ills, one dollar the bottle, six for five. Thank you, and you'll thank me. It will be the best dollar you ever invested." Our impression dating from that time was that Indian dancing was just as meaningless, and almost as alcoholic, as the medicine that went with the rest of the show. This is the impression most people have, gathered from the same source; but they are just as mistaken as we were mistaken, for we soon found out that among the Hopis dancing is a serious business. No Hopi ever dances just to please the wife or to be sociable with the neighbors. Not he.

Dancers Date Up the Months

To go through the Hopi dance program, which includes nearly every month of the year, and in some cases the heft of the month, you will find that when it comes to the dance he is all dated up like a debutante—and heavy dates at that. However, there is this difference between the Hopi and his white brother, who is a "dancing fool." All of the Hopi dances are religious, have a world of religious symbolism back of them, a mine of mysticism, and are sacramental in that they are but the outward expression of an inward desire: a cry to those above for help, for rain, for crops, for guidance. Beginning with the New Fire dance in November, which is the Hopi New Year, we are giving a partial list of the important Katcina, or ghostly dweller of the underworld, celebrations danced by the Hopis. As stated, November has the New Fire; December, the Winter Solstice; January, the Abbreviated Snake or Flute ceremony on alternate years; in February, the Powamu or Bodger celebration; from March to July, the Abbreviated Katcinas and the Departure of the Badger and other clan

ancients; in August, the Snake or Flute dance on alternate years, and in September and October, the Basket dances. Now, if you think these do not round out a season, count them and see.

We shall go into detail in the next chapter on their greatest dance of all—the Snake Dance. There is nothing like it in the world. Even the short dances given nightly at the Hopi House will give you an appreciation of their use of the dance as an expression of religious symbolism and clan life, and as a vehicle for their physically elemental and their soul yearnings.

CHAPTER IX

Hopi Indian Snake Dance

LL of the Indian tribes in Arizona have certain religious ceremonials in which dancing and pageantry play a part. The Indian is incurably religious in his own way, and his way is not always the way of the white man. Even when he pretends to conform to the white man's creed he will accept certain articles of faith, and then he will give his own interpretation of them; he will take the ritual of his pale brother and change it to suit himself. This is witnessed in the case of the Pima, Papago, and Yaqui of Arizona.

It ought to be said at the outset that there is a great deal about the Indian ceremonials and dances that the white man does not know and never can know. They have their little secrets, and all of their religious orders are closely guarded secret societies, more or less. Some very bright, scholarly and sympathetic men have lived for years with some of the Indian tribes of Arizona, and while they found out a great deal which has been very valuable, it is a question as to whether they ever got to the heart of the religions of the various tribes. In order to be convinced of this, all you have to do is to read some of the conflicting interpretations regarding Indian traditions and ceremonies. The Indian is reserved, secretive, inscrutable, and undoubtedly maintains the same attitude toward the inquirer that a Mason or Odd Fellow would maintain toward an outsider trying to find out all about his secret work. With the Indian it is even more so.

Even the Apache, regarded as the very incarnation of all that is fearless and bloodthirsty, is in his religious life the very soul of superstition, which introduces in his make-up at times a contradictory timidity. He dances out his religion in the Devil Dance and the Medicine Dance. The

Navajo is strong for the medicine man, and so powerful is the hold of the "shaman," or medicine man, and his assistants that he has almost ruined the tribe. They haven't time for anything else except to follow his directions and dance; and they have some beautiful dances. Although most of their public dances are in charge of the shaman, and are for the purpose of curing the sick, the War Dance, the Plumed Arrow Dance, the Hoshkawn Dance, and the Fire Play Dance are all beautiful, and have a world of mysticism behind them.

The Hopi a Past Master in Dancing

But in all the dances among the Indians the Hopi wins hands down and world without end. As beautiful as is the Wand Dance of the Navajos, the Snake Dance of the Hopis is rods and chains and leagues and miles beyond it. There is nothing in all the great, round world like the Hopi Snake Dance; you won't find anything like it in the mountains of India, the plains of Tibet, or the jungles of Africa. It is the culmination, the quintessence of a life dedicated to religious ceremonials from the time the baby is a few days old until his death; and more than that, for death does not release the Hopi from religious ceremonials. Four days after death he is supposed to walk from his grave to the underworld, somewhere below the Grand Canyon, and there take his place with his ancestors, becoming a Katcina, who will revisit yearly the silver glimpses of the moon, and take part in religious ceremonials.

There is one thing about the Hopi which is different from the Navajo and the Apache. The Apache is superstitious and forever trying to elude in his ceremonies the devil and his imps; the Navajo is almost a valetudinarian—if you can apply that term to an Indian—in that his health is always worrying him. If he isn't sick, he is afraid he is going to be, and so he almost becomes a nervous wreck going the ceremonial round directed by his shaman. The shaman is likely to order a dance in health as well as in sickness, working on the same lines as an old schoolmaster back in Texas, who used to lick the kids to bear out his

theory that, if they didn't need it now, they would in the future. The motto of the Navajo medicine man seems to be, "A dance a day keeps the sickness away."

The Hopi Dance a Passionate Prayer for Rain

But the Hopi seems to suffer a contradiction in character in that, while he is almost excessively religious, he is, at the same time, more of a materialist than the Apache or Navajo. He is the dancingest dancer of them all; he dances every month in the year, and most of the month. His ceremonies are the very essence of all that is elaborate, and they all tend to one end. If you could compress everything taken out of his dances, his religious ceremonials, his prayers, his incantations, the crying aloud of his secret heart, and his flesh, you could put it in one word—RAIN. This is expressed also in concrete form in the vestments which not only the men but the women wear during the ceremonies; in the decorations of their altars, in their matchless and unique sand paintings, in the offerings placed at the springs and on the shrines, everywhere and in all places the Hopi sends up a fervent, agonizing, heart-broken prayer for rain. This is evident in the dances of the women: the Marau, the Ooqol and the Lagon ceremonies, which are performed partly in secret and partly in public in November, the last alternating with the first two on alternate years. It also appears in the New Fire ceremony, the Winter ceremonies, and the Powamu ceremony, and the Katcina dances, the Blue Flute, and the Drab Flute, as well as the Snake Dance. Through it all the Hopi shows how he is bound with hoops of steel to that terrible law of economic determinism, and which is no respecter of persons, affecting a red man as quickly as it will a white man.

And, judging from the time and the energy the Hopi puts into his dances, all that he wants rain for is to enable him to grow enough corn and beans to give him enough strength to go through with his dances, which are prayers for rain to grow more corn and beans. All of his dances when his heart and his flesh cry out for rain are efforts to outsmart or "out-medicine" the unwilling gods of the six points, for the Hopi has all the points of the compass the white man

has—north, south, east, and west—and also has two to go on: above and below. Pan is dead and the Pantheon has fallen into decay, but the Hopi has enough gods to stock two or three Pantheons; they are all over, and in his mind they all have something to do with rain. So he has a whole, teeming, crammed-full universe of reluctant gods to contend with. Therefore you can see why his ceremonies are so frequent, long, pretentious, and really awe-inspiring. If these ceremonies do not compel the unwilling gods to bring down the lightning which will pierce the rainclouds, then he is ruined; he will starve to death. And all that a man has he will give for his physical life. We would do just about the same thing if we believed that we would starve to death if we did not.

Another thing worth noting is the rudimentary dramatic instinct which is born in us, even in the most primitive man; and we see this in the Hopi in its *n*th power.

The Snake Dance the Topnotcher

But we started in to tell you something about the Snake Dance. This is something which is so thrilling, so dramatic, so picturesque, and so unusual that people come from all over the world to see it: and it has so taken the popular fancy that to-day it is imitated by a company of white men in Prescott, Arizona; and those who have seen the Hopi dance it at Walpi and Oraibi in August and the white men of Prescott, who call themselves Smokis, dance it in July, say that this reproduction is so great that at times it is hard to tell the difference. On alternate years this dance takes place in two Hopi cities—in odd years at Walpi, and even years at Oraibi. It occupies a period of sixteen days, although there are only nine days when there is much ceremony, which takes a crescendo movement, and culminates in the dance of the last day.

The opening of the ceremony occurs when the ceremony crier goes up from the kiva to the roof of the chief's house, makes lines of meal to the four corners of the earth, places prayer sticks made of feathers and paper in a stone altar, and scatters meal to the east. Then when the sun rises he

issues this cry: "You people, the sun is shining for you. Come and hear what I say. In sixteen days the clan will finish their ceremony. Because of this you men and women and children will be happy through these days. Now do not be angry with each other, do not have anything bad in your hearts. It may be, if there is a child or anyone who has anything good in his heart, there may be rain and no one will die till his time comes, and you will all have a chance to see this dance, and even before the dance we may have rain, and have a chance to drink the water."

No Hurry About Beginning

After the call there is nothing to do for eight days, until the antelope priests go into their kivas. It is said that the ceremony officially begins then. Then games are held, usually road races by the young men, "before-breakfast" marathons, merely a small matter of running thirty or forty miles. What an appetite they must have! From four to seven days are spent in gathering snakes from the four quarters of the desert—blue racers, bull snakes, rattlers—rattlers being strong favorites. After a hundred and fifty or two hundred snakes have been gathered, they are taken to the sacred kiva, where none but the priests can enter. The kiva is a large, underground basement, usually running the length of an Indian house. In the kiva the snakes are first washed in large earthen jars. The snake priests have previously purified themselves with ablutions; but the "snake brothers" cannot do this for themselves, consequently the priests do the washing—and a strange, wiggling, whirling, hissing, rattling washing it is. There is no washing like it on earth. Then the snakes are thrown on the sacred altar of the kiva—an altar made of varicolored sand, and scattered with numerous designs over about four by six feet of floor space. They are kept herded on this altar as well as possible by an attendant—and it is no job for a one-armed man—until they are removed to the sacred kisi, which is merely a small, built-in, rude shed, always in a grove of cottonwood trees.

Before the Snake Dance begins in any of the Hopi cities

a desperate-looking two-gun Hopi, both guns displayed prominently, who acts as a kind of policeman, goes around collecting cameras. No pictures of the dance are now allowed to be taken, this having been prohibited for several years.

The Performance Finally Begins

The Snake Dance proper begins just about sunset on the last day, and lasts for a little over thirty minutes. The first man to appear is the "thunder priest." He comes out of the kiva with a whizzer, or bull-roarer, which resembles a tin can on a string. He can make a terrific noise with this, and he does it, running to every point of the compass and twirling his raucous-sounding whizzer violently to scare off the evil spirits. These malevolent gentlemen must be gotten out of the way before the ceremony can begin. After the thunder priest comes the asperging priest, who with the tip of a feather sprinkles cornmeal all over the dancing inclosure; then the announcer, who states the object of the dance in pure Hopi, which is really a prayer for rain; after them the antelope priests. The leader has a large, bright, parti-colored wand, called a tiponi, which is the badge of the chief of ceremonies, and seems to be made of torn paper. He leads the antelope priests, who march around in solemn procession, as grave as supreme court judges. There are over twenty of them, and their copper-colored bodies are decorated in front with white paint bearing the symbol of the snake, and on the back with forked lightning. They have on white kilts, with green, red, and black embroidery resembling rainclouds. The antelope priests are really the chorus of the dance. They march around the dance inclosure about four times, shaking a white rattler, which looks like an overgrown garlic or baby rattler, and sounds much like the latter. Every time they come to the kisi where the snakes are they stamp at the sipapu, or opening. Then they line up in front of the kisi, shaking their rattlers from left to right. At the conclusion of their dance Hopi women come in and make the Hopi sun symbol with sacred meal.

Hopi Snake Dance, Showing Rattlesnake in Priest's Mouth.

At Last the Snake Dancers Come In

There are over twenty-five of them, led by an old man in fillet and anklets of cottonwood leaves, white kilt and white sash, holding a bowl of medicine. The snake priests follow in single file, making four trips in a circle, pausing each time in front of the sipapu to stamp their feet. They carry a snake emblem made of sticks and feathers, and snake-whips made of eagle feathers. They dance in a rocking motion from left to right in front of the antelope priests, who join them. The antelope priests sing and shake their rattlers, while the other priests shake their prayer emblems at the ground. This singing is something eerie, typically Indian and primitive, and a composer could make himself famous if he could arrange a musical score for it.

Finally the dancing and the singing die down, and the snakes are taken from the kisi, certain priests taking the snakes up and placing them in the mouths of others. The snake priests separate into groups of three—the carrier, the hugger, and the gatherer. The carrier gets the snake out of the kisi and dances with it in his mouth; the hugger grabs him around the neck, jumps up and down in a circle, and teases the snake into activity with his feather whip. And how they do squirm and twist! One snake so twined itself in the hair of a dancer that it had to be dislodged with difficulty. Others twisted themselves several times around the neck, making the queerest and weirdest looking necklace; others were crawling up and down the backs of the priests.

The Super-Mystery of Hopiland

But the question of all questions about this amazing weird dance is, Why are not the Hopis poisoned by the snakes? for they are sometimes bitten. But who ever heard of one being fatally or even seriously harmed? And why not?

Opinions on this are as thick as the well known autumn leaves in Valambrosa, but a good deal wider apart. Here are some of them: The Indians plague the snakes and cause them to expend their supply of venom, which takes some

time to renew. As they treat the snakes rough from the time they catch them in the desert, throw them in a sack, and imprison them in the kiva, giving them a good deal to expend their venom on daily, we can readily see why some herpetologists, who make a specialty of working with rattle snakes, should hold this view. Observers opine that the care exercised by the handlers on each snake is so Skillful as to make a bite impossible; but they scoop them up in wiggling, writhing bundles by double handfuls, reaching in, grab-bag fashion, and pulling them out by hands guided by touch, and not by sight. One of the most amazing explanations is the "psychological" one. They say the Hopi regards the snake as his brother, and handles him with such confidence that the snake returns the favor and does not bite. This, in spite of the fact that they rough-house him, feather-tickle him, throw him down, grab him by the neck, and otherwise give him the whole works of a third degree, which, to put it mildly, is anything but brotherly. On the other hand, and right conversely to this view, some argue that the rough and unbrotherly treatment the snake receives and the strange surroundings he is placed in so frightens him that there is only one thing on his mind, and that is to get away. While others think that instead of the snake being the charmer he is charmed; the Hopis hypnotize him. And still others say that the Hopis drink a concoction, which, followed by the post-ceremonial emetic, renders them immune to the poison, both of these drinks having successfully eluded scientific analysis and discovery all these years.

The Smithsonian Institute, it is understood, approached the question many years ago on the more rational hypothesis that the snakes were defanged by the Indians prior to the dance; but Mr. Walter Fewkes, of that institution, is quoted as expressing abandonment of that theory after having one of the snakes caught immediately upon its being released from the ceremony and shipped to Washington, whereupon careful inspection proved it to have its fangs and poison sacs intact.

However, Mr. E. M. Sweet, Jr., an Indian Service Inspector under Commissioner Cato Sells, had occasion in

1920-21 to make an official investigation, certain aspects of which led into the inner activities of the Hopi dances. His report to the Indian Office at Washington carried as supplements, along with other documentary evidence, the affidavits of four Hopi Indians, ex-members of the Snake Clan, who had forsaken the old Indian ways for the ways of the white man, which they considered better, neither witness knowing, says Mr. Sweet, what the others had sworn to, all testifying that the snakes are defanged and the poison extracted and the teeth broken the very first thing after they are taken captive by means of long sticks on the desert. Some of these former members of the Snake Clan say that the very secretive rite going on in the kiva during the forenoon of the last ceremonial day wherein the snakes are washed, is really a piece of inspection to see that they have not overlooked any bets, or bites, in the snakes' mouth, during their not-exceeding-nine-days captivity. In order to do justice to this question I read everything I could get my hands on in the large library at San Francisco, consulted with herpetologists, and talked rattlesnakes until I began to see them at night. I wanted to settle the question as to whether a snake which was defanged could grow a fang back. Finally a distinguished scientist of San Francisco called my attention to the work of Noguchi on "Snake Venoms." On p. 58, under "Poison Fangs" it is said that "In all proteroglyphous snakes (which includes the rattlers) the number of active fangs is usually two, arranged side by side. Behind the inner fang are several reserve fangs in developing order, which take the place of the active fang when it is damaged or shed." These ex-members of the Snake Clan say that the fang grows back, and their testimony tends to show that the meekness of Brother Rattle Snake and Brother Blue Racer while thus being man-handled is one with the weakness of Samson shorn of his locks, or the meekness of the dehorned cow.

Out of the foregoing explanations of this super-mystery of Hopiland the reader is at liberty to pay his money and take his choice.

After all the snakes have been carried—and the perform-

ance is not over until every one has been carried and thrown down once—the antelope chief priest comes out, makes a large circle with cornmeal, divides it into quarters, and then the snakes are all thrown into this inclosure, and the women cast meal upon them. When the snakes have been thus purified, with a wild cry and with mad abandon the priests jump into this wriggling, hissing mass, grab up the snakes, run wildly with them down to the plain below, point them in every direction, and send them out, whispering a prayer to them to bring back the rain. When this is concluded the priests take an emetic, and they then repair to the kiva and eat the sacred cornmeal wafer, the piki, which the women have baked on hot stones for them.

Process of Disenchantment

As far as the antelope priests are concerned, the dance is now over, and they go to the kiva, dismantle the altar, disencharm themselves and become private citizens once more. But the snake priests have to sleep all night in the kiva, go through various ceremonies, and then sprinkle ashes over themselves with their left hands—symbol of the end—before they can be disencharmed and go back to everyday affairs.

What does this dance signify? It is a fervent prayer for rain. According to one of the earliest stories of Hopi mythology, the Snake Clan and the Antelope Clan came from two brothers who married sisters, daughters of the snake mother. In a time of great drought, Tiyo, the ancestor of the Snake Clan, sailed in his boat down the Colorado River into the Grand Canyon, and from thence by an underground chamber to the underworld somewhere between the Canyon and the San Francisco Mountains. In the underworld Tiyo learned from the Spider Woman, who knew how to weave the clouds together, the secret of bringing down rain. The ceremonies already described, it is said, faithfully follow this revelation of the Spider Woman. So it is not snake worship, but an ardent prayer for rain on their corn in the desert, and it has a poetic conception of "weaving the clouds together" behind it, and hundreds of years of tradition.

CHAPTER X

The Apache Trail

The Apache

WHAT a tremendous theme for a pageant, for through the dim, starlit centuries multiplied feet have pressed the soil of its mystic windings. First, prehistoric man, antedating the Cæsars, to whom metals were yet unknown, wielding his stone ax, and taking aim with obsidian arrowheads. Cowled monks in garments gray climbing its tortuous and rocky cliffs, with uplifted cross, seeking straying souls. And Spanish Cavaliers, the Conquistadores, in steel armor shining in the bright sunlight, with sword and lance; and liegemen of the Dons armed with harquebus taking possession of the trail in the name of their king. This, while the American nation was yet in the womb of time. And then the painted Apache, the very incarnation of the spirit of slaughter, sweeping over its mazes with winged feet like a dread besom of destruction. And, finally, the white American, redeeming it with his brain and brawn. There it is in a few sentences, and yet how it lures through the lengthening years.

To write a description of the Apache Trail and leave out that chief actor, the Apache Indian, and a touch of his story in Arizona, is like painting a picture without a background. The historians say that the Apache reached Arizona about the middle of the sixteenth century, coming originally from Mexico; and most folks say they wished he had originally stayed there. The word Apache means "enemy," according to a Zuni word, and he lives up to it. From the time of the Spanish colonization of New Mexico, to less than a generation ago, the Apaches have been noted for their warlike disposition, raiding white and Indian settlements impar-

tially. He is little physically, averaging about five feet eight—but, O, my! It took the United States army to soften his moral nature. When the Spaniards came, about the beginning of the seventeenth century, and made notes on this part of the country, they said the Apaches were not so numerous, but their numbers have apparently been increased by migration, and by captives from other tribes within their territory, for their forays and conquests resulted in the absorption of a large foreign element: Piman, Pueblo and Papago, Yuman and Spanish, and through intermarriage with other tribes they increased. Captives were treated with disrespect, virtually made slaves, and marriage broke clan ties.

The Apache Tribal Groups

The Apaches are divided into a number of tribal groups who have been so differently named and defined that it is sometimes difficult to determine to which branch writers refer. The most commonly accepted Arizona divisions are: The Vaqueros, divided into five clans; the Chiricahua; the Pinalenos; the Coyoteros; the Aravaipa; the Gila Apache; and the Tontos. Dr. Dorsey, curator of Anthropology of the Field Museum, divided the Apache very conveniently into the Eastern New Mexico and Western Arizona bands. The Eastern included Jicarilla and Mescalero Apache; the Western, the Coyotera, Pimal, Aravaipa, Chiricahua, and others.

Being nomadic, the Apache practiced agriculture to a very limited extent only, even less than our own gentlemen, absentee-landlord, embroidered-nightshirt farmers. This was before his permanent establishment on reservations. He subsisted chiefly on the product of the chase and on roots (especially the root of the maguey), and on berries. He knew his berries, and liked them. He will eat acorns, sunflower seed, pinenuts, willow-buds, juniper berries, mesquite beans, and mescal root. He is strong for mescal—and the stronger the mescal is, the better. It is food and drink to him—as you might say. He has one art that the white man is trying hard to get hold of—he is an expert home-

brewer. He has a way of treating mescal "cabbage" that when fermented runs about 100 proof—maybe it's a thousand. It is so strong that it is said if a jack rabbit were to drink enough of this—one or two thimblesful—he would have courage a-plenty to go out and spit in a bulldog's eye. It is even more potent than double-distilled corn liquor in making the drunk come.

Preparing Poisoned Arrows

In the old days the weapons of the Apaches were bow and arrow, spear and war club. They were death on poisoned arrows, which they made by dipping the point into the liver of a deer which had been bitten by a peeved rattlesnake. They worked the rattler up by plaguing him until he bit into the deer. They allowed the body to putrefy, and then dipped their arrowpoints into the liver. Speaking of the Apache bill of fare, he had his gastronomic peculiarities: he would eat anything he could wolf down his neck, no matter how long it had been delayed in transmission or kept out of cold storage, for his stomach, like a certain proposition in Euclid, was "equal to anything." But they had their tabus—things they must not eat. Fish and bear, though abundant, were tabu; so was pork. They had few arts—which we can readily believe—but the older women attained high skill in making baskets. The older Apache women do all the hefty work; the flappers and the matrons of the younger married set are not so devoted to physical exercise. Their round dwellings, hogans, or wickiups, were of brush mostly, made by the older women. These buildings are neither neat nor gaudy. You can buy an Apache "house" and the ground it stands on for about $8.75—half down, and the balance like rent.

Superstition All-Pervading

In spite of his fierceness, it is said that the Apache is now light-hearted, even subject to fits of timidity, and excessively superstitious. He is strong on the use of charms, specializing on beads made from rock that has been struck by lightning, or wood from a lightning-blasted tree. Stone beads obtained from graves and ruined pueblos

are much in demand, and the medicine men work overtime providing amulets to keep off the evil spirits and their numerous devils. They have three kinds of dances, and two of these are devoted to superstition: the Devils' Dance and the Medicine Dance. The Apache is a great gambler, having some primitive games of chance of his own and some of his white brother's. He has absolutely no prejudice at all against a gambling game, no matter where it is from. The women are even more so, dallying daily with Lady Luck. They are fond of a game played with cards, called "coon-can." This throws a light on a very important item of Apache social life, marriage and divorce. They had "companionate marriages" long before the white man ever dreamed of them, and divorce is so easy that it is often surprisingly, even shockingly, sudden. For instance, one of the qualifications of a good husband in Apacheland is that he must, no matter how he gets it, supply his wife with all the money she needs to play coon-can. All is well if he can, but if he can't, he is canned. If he falls down here, he is out of luck, and some day when he is returning to his wickiup after a round of pleasant diversion, he may find his second-best saddle hung up in a tree near the house. This is a sign of divorce, absolute and instanter, and is more than an invitation; it is a command for him to ride while the riding is good. The Apache is a polygamist naturally, also simultaneously and successively. Very often a man marries his wife's younger sisters as fast as they mature, or if she has none he marries among the members of her clan—as he himself modestly expresses it, "to prevent the women fighting among themselves."

Plural Marriages Popular

Most of the marriages are brought about by purchase—usually on a bear market; nothing very expensive. The wedding presents all go to the wife, which she distributes to her relatives; the presents must be useful. There is one Apache custom that is not so bad, and proves that, although he never wasted much time at school, he is not so dumb: It is a tribal law that a son-in-law must never look at his mother-in-law for fear that he will go blind, and she must

never speak to him. When the wife is away, the mother-in-law prepares the meal, puts it on the table, leaves the wickiup, the son-in-law goes in and eats, and they never speak as they pass by. When the Apache dies, which he now does rather naturally, with no help at all except from the white man's civilization, his wife exhibits her deep sorrow by having her hair bobbed: the deeper the grief, the shorter the bob—even to the boyish cut. Everything he owned—it isn't much—is buried with him, and the funeral service consists of an oration bidding his spirit to go to some foreign happy hunting ground and never return.

Reservation Etiquette—"On Agin, Off Agin"

There are now about 5,000 Apaches in Arizona, and most of them are on the White Mountain Apache Reservation, east of Globe. This is a long strip of fine land, 95 miles from north to south, and 75 miles east and west. It was on this reservation, near San Carlos, that Augustus Thomas secured the material for his play "Arizona," and it was near here that the terrible Oatman tragedy took place in 1851. The Apaches killed the men and most of the women, and captured a little girl, Olive Oatman, who was held captive by them for nearly two years. They then sold her to the Mojaves, who held her until 1856.

In 1870 Chiricahua Apaches, under their leader, Cochise, revolted and broke away from the reservation. Cochise died in 1874. In 1877 Geronimo and other chiefs broke away from the San Carlos Agency and began depredations in Southern Arizona. Geronimo would surrender, break out, and surrender again. General Cook did a great deal toward subduing these renegade Indians, but it was not until General Nelson A. Miles came that Geronimo finally surrendered and was put on the reservation at Fort Sill, Oklahoma. In 1878 Chief Victorio started a little war of his own, fighting peaceable settlers, the United States army, and the Mexicans. Victorio escaped into Mexico, after killing hundreds of white settlers in New Mexico and Arizona, and getting away from the United States army, which outnumbered him about five to one. He was shot

so many times in the fight in Mexico that he literally bled to death.

It was not until 1900, however—not so long ago—that the Apache ceased from troubling.

Then the Trail

You will doubtless recall the small boy who told his grandmother that if she ever attended a circus she would forget all about prayer meetings. If ever you go over the Apache Trail, you will forget a lot of lesser trips you have taken in this life, for it swallows up all the others, just as a hundred dollars includes all the lesser cents below it.

We well remember the trip we made out of Phœnix one rare morning early in spring. It was an occasion such as paints pleasant pictures on the walls of memory. We left the city of the fabled bird which rises from its own ashes, fully insured, and were soon out in the open country. To our east was Camelback Mountain, and that faithful Moslem driver who stands at the camel's head, petrified in prayer. Now Papago Sahuaro National Park, which has desert vegetation in all its glory and is worth going miles to see. Next we pass Tempe, where most appropriately the State Normal is established in stately dignity in this Vale of Tempe, recalling "the glory that was Greece." Comes Mesa, a beautiful town with wide streets, suggestive of Salt Lake City, and built by the followers of Brigham Young. Out from Mesa is a Mormon temple. There it stands, a greater and unmolested and untarnished Luxor, amid the once-barren sands of the desert, but which have been transformed into a veritable garden of the Lord, aflame with color from a profusion of beautiful flowers. This temple and spacious grounds cost almost a million dollars, and is the most beautiful building in all Arizona.

Superstition Mountain

Between Tempe and Mesa, as you head for the Apache Trail which begins near here, you catch a view of Superstition Mountain, and your heart responds with a wild allegro movement when you first get sight of that spacious sheet of rock, which stands like a Gibraltar, without the

Superstition Mountain, on Road to Apache Trail and Roosevelt Dam.

insurance sign, amid the shifting sea of desert sand. It reminds us of Sinai in that it is the mount that cannot be touched by hands. The Apache and all the other Arizona Indians have a superstition that if they touch this mountain they will die, for years ago the savage Apache murdered another tribe there, and so ruthless was the slaughter that even the Apache was frightened and made the mountain tabu. As we ride along in our Packard a slight mist covers the crest, and we see in fancy those mysterious Indian maidens who were said to inhabit the top: troops of beautiful, tall houris, with ravishing lips and eyes, their dewy hair blown back like flame—and our hearts are held captive in the tresses thereof. Superstition Mount is a subject for the painter, a Valhalla for the imagination, builded for an artistic canvas whereon may hang a thousand palettes and brushes of mighty men. We circle the mountain, even as the Israelites circled Sinai, and with every bend of the road we get a new throb out of it.

The expanding skyline of Superstition Mountain is rough and jagged. There are little canyons dividing it at the base for a little distance on all sides, and these are filled with groves of Sahuaro cactus which stand up like the pipes in a cathedral organ. The Indians say that in these canyons the spirits of those who were slaughtered forever groan and make continual intercession to be released from the dark recesses. You could not pay one of them to venture into one of these picturesque, yet terrifying-looking, little canyons that reach to the top and, dividing the mountain, give it such a picturesque outline on the summit.

Near Superstition Mountain there is a goldfield, Youngsburg, which one day may startle the world. Then we sweep by those strong, bastioned rocks which point their fingers at the sky, the Palisades, which for all the world remind us of huge Gothic cathedrals, or castles on the Rhine. And all along this road, once trodden by the foot of bloodthirsty warriors, we catch visions of splendor which we never before imagined existed; and we are set to wondering how any people could have been as cruel as the Apaches while living in the midst of such majesty, for scenery should transform the soul.

"Going Up Salt River"

Next we come to Canyon Lake, which is a storage lake, and catches the overflow from Lake Roosevelt. In the old days, "going up Salt River" meant you were ruined politically, socially, financially, and every other way; but now a trip up Salt River from Canyon Lake to Horse Mesa is like taking a trip through the fiords of Norway. It is not only the way of prosperity, but the way of beauty, for you go for sixteen miles in a motor-boat through tall canyons, whose gigantic sides rise sheer and straight for hundreds of feet from the water's edge. And you are between these picturesque, awe-compelling solid blocks of rock all the way, while the eagles in azure winging above you seem like cameos on a block of purest lapis-lazuli. This is, of course, a watery detour from the trail, and if you go this way you will have to take the trail again from Horse Mesa dam. But back to the trail, and we wind our way to Tortilla Flat, where there are some very pretty limestone cliffs, and Nature tried her hand at sculpturing. Here you may see as many images in the limestone rocks as you have imagination for. You want to agree with your guide, and really you have a great deal carved in the high-reaching limestone rocks that appeals to your creative imagination and etch themselves as pictures on your brain.

A Trail with Bloody Traditions

At Canyon Point from the side of the road there is a wide-open space, which, like the rat hole in Lincoln's office, is "worth looking into." It was originally 280 feet deep, but it is said that so many chauffeurs tried to go around this picturesque, winding road in a manner practised only by those who are responding to a four-alarm fire that it is not as deep as it used to be. But, don't worry; the road is as smooth as a city street and as safe, even safer than most of them; and you are in a scenic setting which would kill a confluent case of ennui even in a bored British baronet, and we can say no more than that. I am telling you this spot is a thrill. Two miles above here, where the road turns to Horse Mesa, on top of the hill to the right, you

look down and behold the old, original beaten trail of the Apache. In the early days the trail followed the watercourses mostly, but not always. It is rather reassuring to know that we are going over this dark and bloody ground in such comfort. In this vicinity is Skeleton Cave, so named because it was pretty well filled with skeletons of Apaches, who in 1893 were brash enough to fight a squadron of United States cavalry. The Apaches, thinking themselves secure, gave battle from the cave, but the rifle fire was so deadly that many redskins "bit the dust." Their bones were there for many a day—hence "Skeleton Cave."

A Surfeit of Scenic Splendor

Then we come to Fish Creek Hill, which is a twelve-per-cent grade, and as we climb to the crest we are almost surfeited with scenery. There are walls which remind you of the Grand Canyon, with its towering magnificence and coloring. You are now 3,980 feet above sea level.

Fish Creek Canyon is not simply a canyon, but a succession of canyons running criss-cross, and everywhichwise-way into each other, which makes it all the more magnificent. They say it is a sight to pass this way at night when the mellow moonlight is toning down the sharp outlines of earth; there is one of the finest groves of the Sahuaro to be seen anywhere, and the silver glimpses of the moon make these sentinels of the desert seem like men standing guard, erect Apaches defending the trail.

Geronimo Mountain! What memories of the old Apache chief it brings up! And then from the crest of the hill we catch our first view of Roosevelt Lake. There it stands in the middle distance, a huge sheet of water thirty miles long and four miles wide. To the north and west are the Four Peaks, in the Mazatal range, and the Tonto National Forest is at their feet. Tonto Creek we know is just a little to the east. Here it is that Zane Gray laid some of the scenes in his novel, "To the Last Man." It was the fight for this water in Tonto Creek between the sheepmen and the cattlemen that led to the extermination of both sides, except one man. This is a solemn fact of history of early-day life in

Arizona, and shows how strenuous things were then; how exciting, and yet how romantic, and how precious water was. If there had been coöperation, and if the energy expended in fighting had been used in conserving the water supply, the story would have been different. Big business is not so romantic, but it is certainly efficient.

Still farther to the north and east and beyond the lake is Geronimo Mountain. Behold! it stands in massive, solitary dignity, all alone, like the Apache chief for whom it was named—grand, gloomy, and peculiar. And yet how it impresses one! In the far distance to the north and the east the Sierra Anchas raise up their craggy heads. There are cliff dwellings over yonder, and if one had the time one ought to stay at the lake, where there is a very fine hotel, and visit them.

Roosevelt Lake and Its Life-Giving Waters

When we caught a glimpse of Roosevelt Lake out there in the very heart of the desert, we experienced all the emotions of the remnant of the ten thousand Greeks who marched with Cyrus in that celebrated Anabasis or "going up" which Xenophon told about. You will remember, after their months of battle and suffering, that they headed for home, and finally one day they caught sight of what they were looking for—the Euxine Sea. They had been marching in orderly, military procession, but when they caught sight of that beloved body of water they could not be restrained; the whole army broke into a run and then into a shout, "Thalassa! Thalassa!" ("The sea! the Sea!"). And the hardships of life were buried beneath its blue waters in a moment; and an enthusiasm strong as its mighty waves went surging through their frame. So was the thrill in beholding this great body of water in the midst of the desert, a river of water in a dry place, and a symbol of man's fight with nature, and his overcoming it; and through its waters the conversion of the curse, for the waters go rippling softly and well on their mission of mercy through many miles, making the desert to blossom and burgeon like the rose.

Soon we are at the life-giving lake, whose ponderous steel and granitic teeth are set within the strong marble jaws of the Tontos, where they conveniently come close together, making assurance doubly sure and effective. A better spot could not have been selected.

A little history of the dam would be interesting. As far back as 1889 the harassed water users of the Salt River Valley began looking for some means of storing up a supply of water from the Salt River. After much search the most desirable site was held to be at this junction of the Salt River and Tonto Creek, where the river passes through a narrow gorge. On June 17, 1902, President Roosevelt, after whom the dam was named, signed the Reclamation Act, which provided that the sale of State lands in Western States should be used in building reclamation works. On March 12, 1903, Secretary of the Interior Hitchcock tentatively authorized the construction of a storage tank to be built on the Tonto site, and on October 15 reaffirmed the order, and authorized that $100,000 be spent, the first installment of a fund which was to reach three million. Also the Reclamation Service purchased all of the existing canals in the Salt River Valley, and improved them. A system of water storage and distribution without parallel was completed at a cost of eleven million dollars. The first stone in the dam was laid September 20, 1906, and the last on February 5, 1911. The height of the dam from the lowest foundation is 284 feet, and it is 168 feet thick at the base, the spillways being placed in the natural rock. When the dam is full the lake is twenty-five and a half square miles in area, holding enough water to cover one million six hundred and thirty-seven thousand acres a foot deep. The dam is not only a wonderful piece of work, but is beautiful, being arched in form, and built of trimmed white stone. It is the gravity type. Of course there was a world of concrete used, and thousands of tons of steel for the more than 400 feet of spillway. The crest length, including the spillways, is 1,125 feet. There is a beautiful, well-paved road over the top of the dam, wide enough for cars to pass each other, and we bowled merrily over. At the dam 24,200 horse-power of electricity is developed. There are two other

dams and reservoirs under the Salt River Project: the Mormon Flat Dam has a reservoir capacity of 90,000 acre feet, while Horse Mesa Dam has a capacity of 245,000 acre feet; also the Granite Reed Diversion Dam, which is fifty-five miles from the Roosevelt, and the Cave Creek Flood Control dam. We will refer to them again in another article.

As we stood on the shore of the lake looking over its silvery expanse we thought of the tremendous contrast: this immense body of water being out in the heart of the dry desert, which has ever been a symbol of desolation and death. There is an added beauty and majesty given this sheet of water because of its surroundings; there is the same spirit in us which prompted the ancient Jews held captive in Babylon to call a body of water smaller than this "the Sea."

The day we were at Roosevelt Lake we saw the wreck of the Santa Maria, the Fascisti plane, which was on its way around the world, but which in a horrible accident the day before burned in Roosevelt Lake. The commander, Pinedo, and his two aides were at Roosevelt Lodge, broken-hearted.

Leaving Roosevelt Lake, to which we shall refer again in another article, we go but a short distance over the trail, and to our right are the Tonto cliff dwellings. These are five miles away, and were discovered in 1877, just fifty years ago. It is not a hard climb, and when you get in them you will learn more in a minute about prehistoric man than you will learn in a week just reading about him. There are still fragments of prehistoric pottery, corncobs—mere nubbins—showing how sore he missed the irrigation which the white man of to-day enjoys. If you want to preach an effective sermon on the value of the Roosevelt Canal, we would simply take and exhibit some of the corn grown under irrigation, and then these nubbins.

Indian Signal Station on a Mountain Top

Leaving the dwellings, we run south and east with the Indian range of mountains to our west, the Palisades and the Apache Mountains to the east, and the Pinal range to the south. We stop at the summit, which is nearly 4,000

feet high, for a last, lingering look at the lake, and as we again view the lake the Four Peaks, which stretch their stubby fingers heavenward like an outstretched hand into the empyrean until they measure a mile and a half high, say good-by to old Geronimo, and turn our face toward Smoke Signal Peak. Here in the old days the Apache had a rendezvous and used the peak as a signaling station, anticipating the modern aviators by writing in smoke. Our Brother in Red had a little system all his own whereby a small column of smoke on the top of this peak, which can be seen all over that immediate country, could be concealed by a blanket, and then revealed by its withdrawal. Thus he telegraphed his messages all over that region. The man who attempted to follow him up Smoke Signal Peak had a rendezvous with Death.

We are now on dark and bloody ground. The Apache used the country we are now speeding over in a Packard for a slaughterhouse in the old days. They would fall, like a thunderbolt, on an unsuspecting camp of white settlers and wipe them out. It was right on this ground also that the Apache Kid, when he was being taken to prison, killed his guards and started his work of terror which lasted for years until he disappeared in Mexico. There are prehistoric dwellings also in the vicinity, but this fertile field for archæologists and ethnologists is just being uncovered. Some things which may yet startle the world, greater even than the discovery of old King Tut, may be uncovered here.

The End of the Trail

From Cemetery Hill we get a view of the towns of Claypool and Miami. Near Claypool the Apache Trail ends, and we soon swing into the Globe-Superior highway for the return trip.

Do you know that America leads the world in the production of copper, and Arizona leads the United States of America, and the Globe-Miami district we are now in leads Arizona? It is worth going miles to see the copper industry—the Old Dominion at Globe, and the Inspiration and Consolidated at Claypool and Miami. It is a far cry

from the day when prehistoric man made a fire over a deposit of this malleable metal, where he could cook his simple meal, and accidentally smelted copper, and thus gave birth to this gigantic industry, to the veritable inferno of flame poured out of the immense crucibles, liquid and terrifyingly hot, in the smelters around here. At Claypool, at a spot which is almost the very beginning of the east end of the Apache Trail, the Inspiration Copper Company has a leaching plant which cost about six million dollars, for securing copper by the electrolytic process. Fourteen immense tanks lined with lead, and having a capacity of hundreds of tons of ore, stretch out before you. Here the raw, ground ore is treated with acid and other agencies, discarded cans from garbage dumps playing an important part, and finally the precious metal is lured away from the base earth by its loving affinity for things of a kindred nature, and, last of all, emerges as a beautiful sheet of copper.

The Globe-Superior Highway Bears Out Its Name

Leaving the fine little town of Miami, which in the language of the miner is a "permanent camp," and will be there a long time because of the immense deposits of copper in the vicinity, we again take the Globe-Superior Highway for the return trip to Phœnix. This highway is a great feat of engineering, as for miles it was blasted out of the side of the mountains at great cost in man-power and money, and in one place you go through a tunnel. It is 89 miles long, and for the most part is hard-surfaced with decomposed limestone, which is as smooth as a mirror and hard as steel. Thirty-five miles of it is concrete.

You go from the mining districts of Globe and Miami, where the solid hills are like iron, and out of which thou mayest dig brass or copper, over the beautiful pine-clad Pinal Mountains. They are well called Pinal, which means pine-covered, and here are lordly trees fit to be the mast of some great admiral, their straight forms swaying gently in the spring breeze like tossing plumes. You reach the summit, which is nearly 6,000 feet high at the crest, and you are hard put to it to decide whether the Apache Trail

has the better scenery or this highway; and you finally settle the question by deciding that the only thing to do is to see them both, which is a wise decision, for the rugged grandeur of the Pinal Mountains, the entrancing scenery at hand, and coming in a vista from the far-off peaks, mile after mile, will long be remembered. At the very crest of the Pinal Mountains the Museum of Natural History of New York has been excavating some stone dwellings. One hundred and twenty rooms had already been located, and when we were first there some two years ago some fifty had been totally excavated. We presume there are a good many more by this time. Two thousand specimens of pottery, shellwork, bonework, stone axes, stone shovels, have been dug up. One stone idol, about ten inches in height and bearing a human resemblance, was discovered. The only piece of metal found was a copper bell. This is right near the summit.

Before reaching Superior we pass through the Tonto Forest Reserve, filled with oaks and pines, and we are in a summer resort section. Then we come past Devil's Canyon, which is too beautiful to be named for any such person. The highest peaks of the Pinals in the distance are crowned with snow, and there is such a profusion of picturesque mountain summits on both sides that we feel sorry for the folks who go to Switzerland, and miss this. There is an awful—and we mean just that by the use of the word awful, for it is full of awe—canyon on our side. And perhaps it is because the place strikes terror to the heart that they called it Devil's Canyon. But did you ever stop to think that in every State a whole lot of picturesque scenery is associated with his satanic self? We have Devil's Kitchens, Slides, Darning Needles, Paint Pots, Canyons, and whatnots galore, all through the Rockies, the Sierras, and the Cascades. Imagine it—the devil started in business with nothing but a second-hand snake, and now he owns nearly all the real estate, most of the lawyers, and a majority of the rest of the folks.

A Never-To-Be-Forgotten Trip

We then begin to go down grade, and soon sight the

hustling little city of Superior, which lives up to its name, for here one of the best copper mines in Arizona is located, the Magma, which has one of the largest and best-equipped smelters in the United States. We pass through this progressive little city, reach Florence Junction, and go down until we again touch the Apache Trail at Apache Junction. Then back again through Mesa and Tempe to Phœnix, the city that has been transformed as if touched by the enchanter's wand, and promises now to grow at a greater rate than any city in the country—California towns not excepted.

If you come from the East on the Southern Pacific you go to Globe and take the stage in the morning from there for the trip over the trail, arriving in Phœnix in the evening for trains east or west; if you come by the Santa Fe, either east or west, you leave Phœnix in the morning, soon after you arrive, take an Arizona Tours car, and go over the trail in the manner described in this article, making the complete circle over the Apache Trail and the Globe-Superior highway, returning to Phœnix in time for your train, either east or west.

The Apache Trail is over a hundred and twenty-five miles long from the point you strike it about twenty miles out of Phœnix to where it ends near Miami. The Globe-Superior highway is 89 miles, so you have traveled considerably over two hundred miles, and yet you have done it with time to spare and without undue haste. You have had the experience of starting out from a hustling city, going through a well-watered and thriving valley, penetrating the heart of the desert, winding over mountains, eating a fine dinner in an up-to-date hotel on the banks of an inland sea, going over summits from whose heights majestic mountains loom in the distance, and historic spots thrill the imagination; then through the very centers of one of the world's great industries, copper; over pine-clad mountains, and again back through the desert, and to cities which have sure foundations.

When you swing around this charmed circle you will say at the conclusion, as Don Quixote used to say when any-

thing very fine happened to him, "We will mark this day with a white stone." You go in such perfect ease with fine cars that you hardly feel the trip when you are through, and you forever have the recollection of a day which passed all too swiftly, and yet one which will live in memory forever.

CHAPTER XI

Arizona To-Day

THERE is a beautiful Indian legend which came to us recently, and recites that when the majestic San Francisco Peaks, which, wedge-like, cleave the desert air in northern Arizona, were first made they were all barren. When they saw the beautiful forest of Coconino near their feet, clad in evergreen pines and incense-breathing cedars, and the foothills with a rich emerald carpet, they smoked in explosive anger, and sent up loud lamentations to the Great Spirit which had just created them, "Why are we thus? Why are we blasted with the heat and devoid of life? Why are all our sides naked, with not so much as a blade of grass, a wild flower, or even a thorny cactus to hide them? Why expose our sterility and poverty to the eye of man?"

And the Great Spirit heard the complaint and said, "I have made thee for my own, that I may look down from heaven upon thee and enjoy thee. The light that I shall send forth from above shall be as a halo unto thee; all the colors of earth and sky shall wash thy sides and give thee garments more colorful than the Orient and richer than the Indies. Even the clouds shall deck thee, and their fleecy, diaphanous raiment shall make thy ruggedness an enchanting vista. Thou shalt have not one covering, but a hundred, a change of dyed garments with each passing hour, the wardrobe of a thousand rich chieftains. Thou shalt be a partner of the skies, share their treasures, and vie with all above and around thee in glory. If I covered thy sides, this could not be." And so the peaks were content.

This is a parable for those who complain about the barren mountains in Arizona. This is the land the Lord afflicted

in the beginning to make it all the richer in the end—even this desert, which seems so forbidding to those who do not understand. The mighty sea made it, burying it ten thousand fathoms deep, and yet pouring into its yellow sands a storehouse of treasure. In the glowing, white-hot heart of the earth the mountains were heated seven times hotter than a furnace is wont to be heated, and then, with a mighty thrust that started at the very center of the earth, they were pushed upward with force, broken in pieces, and then anchored in violence. But from their fractured sides came the rich minerals. Thus also was born even the mountain of the Great Spirit, the San Francisco; though beloved, it knew violence. And after all this suffering the Great Spirit spoke to his beloved mountain, and all of them, in the words of the ancient Prophet:

> O thou, afflicted, tossed with the tempest!
> Behold, I lay thy stones in cement of fair colors,
> And thy foundations with sapphires.
> I will give thee windows of agates,
> And crown thy battlements with rubies.
> Gates for thee of crystal!
> And set all thy borders full of precious stones.

And behold! what a miracle of beauty these once suffering but now strong mountains show, and how, out of the perfection of that beauty, all that is glorious in Nature hath shined. How it lights up the Peaks of the Great Spirit, and also in the far distance on all sides even a dozen lesser peaks catch the beauty that grows out of pain and tribulation, and their rocky sides and split summits form turrets and minarets outrivaling in loftiness and majesty the Mosque of the Sultan, and beholding such beauty we are so bewitched that we expect a troop of loud-lunged muezzins to climb to the topmost top and call to prayer.

A Paradox

Arizona is in many ways a paradox. Its very name suggests this, for scholars are still debating the derivation of the name; whether it comes from the Spanish, "arid-zona," or "arid zone"—or from "arizuma," or "silver-bearing," showing the extreme of poverty and riches. It is the

youngest State in the American Union, and yet it is probably one of the oldest of primitive habitations. It may be that the cradle of the human race was here, and not in Mesopotamia. We know that the Mayans were mixing mortar, and a better grade than we have now, down in Mexico ten thousand years ago; and some believe that portions of the race migrated northward into Arizona early. Perhaps there was a civilization here before letters were learned on the plains of Chaldea, or art began in the Pyramid Land. It is at once the dryest State in the Union and the best watered. It is a land of barren rocks, and soil that is more fertile than that which bordered the Nile, or even fertile Phthia, the heavenly land of the Greeks, which the spirit told Socrates he would go to when he died. The harsh, sticky, sharp-thorned cactus, all the 57 varieties, are to the manor born and native; and yet the most beautiful and softest flowers that ever graced a fair earth grow here in profusion. In the early days the blistering sun was a drawback, but now it is a source of wealth, for crops grow, brought into life by its potential rays, twelve months in the year. It is a land of mountains whereon nothing would grow, flanked by foothills with the largest forest reserves in the world; a land of alkali flats on the one hand, symbols of desolation and death, and on the other hand near-by a place of precious jewels—onyx, turquoise, emeralds and garnets, fit for the fair fingers of a queen; a land of hills with harsh exteriors, and yet out of which treasures in copper, silver and gold, and minerals greater even than the wildest dream of a Monte Cristo; a country where in the early days the surface water was as bitter as Marah, and where to-day they have delved below this bitterness, and streams of water spring up into joyous life as sweet as the waters of Elim. On the wide-open spaces, where once under the sagebrush reptiles lurked, we now have a land of corn and wine, flowing with milk and honey, and filled with the finest of the wheat. This is the spot where the pioneer worked like a slave, and Nature was a merciless slave driver; and behold the change, for the men of to-day have put Nature to work, and how abundant are her labors.

The Natural Divisions

This is Arizona, and because it is even yet a land of paradoxes it is one of the most misunderstood States in the Union; and people who make a hasty trip through one section of the State and view it only from the window of a Pullman car, or from an automobile going sixty miles an hour, are apt to form hasty and altogether misleading conclusions. For instance, if you come into Arizona on the south you are apt to say that the State is largely a desert broken by rough and jagged mountains, and with groves of giant cactus and sagebrush, with the exception of the Salt River Valley. If you come in by the north, you will say that it is part desert, part exceeding high mountains covered with snow from fall to early spring, has some cactus vegetation, but also a wealth of pine and cedar and sagebrush. It is hard to give a rigid topographical division, for there are places in the southeast which reach a high altitude. However, this can be said, the State divides topographically diagonally in two divisions: a southwestern division of low elevation, and a northeastern of an elevated plateau. The northeastern part is canyon-cut, broken, hill-studded, and the table-land has an average altitude of over five thousand feet, some places running up as high as eight thousand. The northwestern part of the State still has the broken, rough mountain ranges not so high, with scarp-fronted mesas, steep gorges, sagebrush instead of timber. The southeastern part of the State, while showing some high elevations, has a world of desert and distinctive desert vegetation. The southwestern part has not such high elevations, yet broken mountain chains, vast stretches of desert, and a profusion of all kinds of desert vegetation, including all the species of cacti from the minute pincushion, which is not much bigger than a baseball, and hugs the ground, through the barrel cactus, the octilla, or devil's coachwhip, the cholla, the giant sahuaro. Arizona is nearly foursquare, being about 340 miles at its longest distance from east to west, and 390 miles at its longest distance from north to south. A person ought to see all of the State—north, south, east, and west—and pay

an extended visit to some sections before he undertakes to speak with any understanding—to say nothing of authority.

When the Sleeper Wakes

We are just beginning to wake up to the importance of this State. As a nation we have not been dead, only sleeping; and yet it has been a long, deep sleep.

You know the American people pride themselves on their mental acumen, yet the truth is that we must often have a skyscraper fall and crack us on the medulla oblongata before we will take a tumble, even when said tumble is to our distinct advantage economically. Read American history and you will find how slow the Congress of the United States was recognizing the value of the country west of the Mississippi River, which they then said was our "natural boundaries." Then they finally had a change of heart, and said the Rocky Mountains were our "natural boundaries" on the west; and it took the hardest kind of work and struggle to get them to take over the Oregon country. They had only a languid somnolent interest in our great southwest, saying there wasn't enough moisture in the whole State to grow a crop, and that it took forty acres to rust a nail. And yet, with the recent floods raging in the Mississippi Valley, and devastating thousands of acres, making a quarter of a million people homeless and dependent, we awaken to the fact that Arizona has the ideal solution for the water question. There are three dams and reservoirs in the Salt River Project: the Roosevelt, the Mormon Flat, and the Horse Mesa. Allied with these are the Granite Reef Diversion Dam and the Cave Creek Flood Control Dam. They irrigate 240,000 acres, representing an investment of $25,000,000, have seven hydro-electric power plants, which generate 84,600 horsepower, have a thousand miles of canals, serve 7,000 farms, which grow alfalfa, grain, cotton, cantaloupes, lettuce, citrus and deciduous fruits, berries, forage and other field crops, with large winter truck industries; raising crops which have an average gross annual value of $25,000,000. Now this is only the Salt River Project. There are other irrigation projects,

for in Maricopa County alone, of which Phœnix is the center, there are 350,000 acres under irrigation. The Salt River Valley has the largest acreage income of any farm district in the United States. In alfalfa it has the largest acreage production in the world. In the principal crops this valley ships annually an average of 5,000 cars of canteloupes, 4,500 cars of lettuce, and 6,500 bales of cotton, much of it of the long-staple variety. The hydro-electric power developed by the Salt River Project is so valuable that the time is coming when it alone will pay for the cost of the project, and give the farmers within the project free water.

Now if we may be allowed an expression, which, although a little trite, comes in as a pat trope here, we might say that all of this is but a drop in the bucket. The Coolidge Dam, to cost over five and a half million dollars, is being built to conserve the waters of the Upper Gila, and will irrigate 100,000 acres in Pinal County. But the biggest thing of all will be the harnessing of the Colorado River.

White Magic

There are four things which make industrial success possible: man-power, transportation, raw material, and fuel. There is no question of man-power, both for executive positions and labor within the State. We believe that Arizona has adequate transportation facilities, fine railroads and good highways, and those in charge of the transportation problem can be relied upon to supply all future demands. There is more raw material in Arizona than is dreamt of in the philosophy of the superficial sightseer. The world has not yet begun even to guess what a wealth of raw material lies hidden in the unexplored treasure-chests of her mighty hills and mountains; and as for fuel, she has a world of that. Neither coal nor oil will supply the motive power of the future, but electricity will; and while Arizona has not much black coal, she has an abundance of "white coal"—water, which can be converted into electricity. Some day, not a generation off, all the waste power which now goes gliding unheeded through the Colorado River into the Gulf of Lower Cali-

fornia will be harnessed, and millions upon millions of kilowatts of electrical energy now lost will be conserved, and these will spin thousands of wheels, working up, on the very spot where the finest cotton in the world is now grown, garments to clothe the world. Great manufacturing plants will spring up in Phœnix and Tucson, Parker, Needles, and Yuma, a town which, by the way, has a magical future more potential than even the dream of those now dwelling there; and some towns not thought of now, even some which have not the slightest shadow of existence to-day, will be manufacturing centers.

This electrical energy will run trains, and thousands of wheels and spindles in great factories. Large cities will be lighted up, and women will come out of the kitchen with hours for leisure, with fresh bodies and minds alert. They will even be magnetic, for they will cook with electricity, and use it in a dozen ways about the home, which will be twice as attractive and comfortable as it is now. The Middle Ages believed in black magic, but the conservation of water power will furnish electricity, which is the "white-magic" of a more enlightened age.

The Colorado River

The Colorado River is so rich in potential wealth that we are embarrassed in writing about it, for fear that some who do not know may think we are exaggerating. In order to allay that feeling we are giving you the best authority in the world. Mr. Nathan C. Grover, in writing the introduction to "Water Power and Flood Control of Colorado River Below Green River, Utah," by E. C. LaRue, says: "The Colorado River is one of the remarkable rivers of the world in its value for irrigation and water power. It combines in proper sequence for complete use a large quantity of water, great concentrations of fall, reservoir sites for control of flow, sites for power plants, and several million acres of irrigable land below the stretch where power may be developed. The Columbia also may be used largely for both water power and irrigation, but no other river on this

continent affords such enormous opportunities for this double use of its water."

The Colorado is 1,800 miles long, rising in Wyoming where the Green River and the Upper Colorado join. It drains vast areas in Wyoming, Utah, Colorado, Nevada, New Mexico, Arizona, and California, the drainage basin covering 24,000 square miles, or one-thirteenth of the area of the United States. It also flows through a part of Old Mexico.

Mr. Grover says that the canyon section of the river offers the second largest concentration of water power site in the United States, and the third largest on this continent, its only superiors being the St. Lawrence and the Columbia River basins. It is ideal for hydro-electric purposes, for most of the distance it winds its way through deep rock-formed canyons, which in many places come so close together that nature seems to have set them as signboards telling man that this is an ideal place for a dam. In the second place, it has a very rapid fall. This is especially true in Arizona, where it falls from Lees Ferry in north central Arizona, just below the Utah line, and the site of the proposed Glen Canyon Dam, to Parker in southwest Arizona, a distance of approximately 550 miles, 2,769 feet.

Nature used the Colorado River in Arizona to do some of the most remarkable things ever done by a river. Here Nature wrote with her fingers on tablets of stone her testimony to be read by all generations. In the first place, the Colorado River made the Grand Canyon in this State, and that is the greatest thing in the world; for the Grand Canyon extends from Lees Ferry to the Grand Wash Cliffs, a distance of 278 miles long, and 13 miles wide in one place, and nearly 6,000 feet deep. Next, competent engineers say that there are thirty-three major dam sites from Parker to Lees Ferry. Twenty-five of these are wholly within Arizona; six are on the Arizona-Nevada State line, and two are on the California-Arizona State line. Mr. E. C. LaRue, United States government engineer, who has been studying the river for years, in his report to Secretary of the Interior, Work, 1925, says that the undeveloped water power on the

The Roosevelt Dam, on Apache Trail.

Colorado River below an elevation of 4,500 feet is 5,743,000 horsepower, under an annual load factor of 60 per cent. Of this there could be developed in Arizona alone 4,353,000 horsepower. It shows the importance of the state. The hydro-electric power thus generated would be sufficient to furnish so much power and at so small a cost that every industry within a radius of 500 miles could be electrified. All the copper in the State could be reduced by electricity, and all the railroads could be electrified. The three major propositions in the development of the Colorado River are flood control, irrigation, and power development. Arizona can furnish the ideal site for any of these.

Arizona has 43 per cent of the Colorado River area, and with the more than four and a quarter million potential horsepower which can be generated on this river alone we can easily see how well Nature treated her. It has been estimated that each horsepower of electrical energy used is capable of creating about $2,000 worth of taxable property. You can figure this out for yourself, for it runs into billions of dollars. The people in Arizona are praying most devoutly that Congress will be as just to the State as Nature was generous.

We cannot discuss all of the major dam sites which government engineers say could be used with profit for irrigation, flood control, or power. We have space to mention only two. Everybody knows about Boulder Canyon, which attracted so much attention in the closing days of the United States Senate in the spring of 1927. Boulder Canyon is 90 miles above Needles by airline. However, although it is called Boulder Canyon, this is a misnomer, for the Boulder Canyon site was abandoned by engineers for economic and engineering reasons, and the Black Canyon site, 21 miles below it, was selected; so if the Boulder Canyon bill is passed the dam will not be built at Boulder Canyon but at Black Canyon. It was easier to change the site than the name. But according to Mr. La Rue one of the best sites on the river is at Glen Canyon. Here, at what he calls Glen Canyon dam site No. 1, the first dam should in all probability be built. We must understand

that in order to develop the river fully several dams will have to be built; some for power only, some for flood control and irrigation, and some for desilting. Each dam built, according to Mr. Grover, should form a unit in any plan of development that is adopted. This being the case, the Glen Canyon dam site No. 1, which is 3,127 feet above sea level, should probably be built first. Mr. LaRue says, and we quote him to be exact, page 24 of his report to Secretary Work: "If the flow of the river is regulated by storage in Glen Canyon, the water thus released from the reservoir, would not only be available for irrigation on the lower river but could be used for the development of power in the Grand Canyon. The continuous power capacity of all power sites in the Grand Canyon and on the lower river would be more than doubled by storage at Glen Canyon; and in addition every hydraulic structure subsequently built on the river below Glen Canyon could be constructed at a greatly reduced cost, as it would not be necessary to take care of long-continued flows of flood water during construction, and the spillway and storage capacity required at such works could be reduced to a minimum. It is estimated that building the Glen Canyon dam first would result in a saving of millions of dollars on dams subsequently built on the river below this point."

There are two interesting things about Glen Canyon dam site No. 1. The elevation is so high that it would water by gravity some high land that could not be reached by a lower dam site. Also it has a capacity of 8,000,000 acre feet, which would effectively remove the flood menace from the lower basin of the Colorado, except from the Gila River, and this will be taken care of by the Coolidge Dam. An interesting thing, and amazingly beautiful, is in the Jurassic sandstone walls here, which rise straight up for nearly a thousand feet, and are within five degrees of being vertical. Talk about the fiords of Norway! The rest of the world hasn't anything that will hold a candle to the Colorado River canyons.

When Congress works out a plan which will be equitable to the States of the upper and lower basin, Arizona will come into its own, and that will be done some day soon.

Hard-headed business men have seen the possibilities of Arizona for years, and believe so much in the potential values of the Colorado River that they are willing to invest millions. And some day the whole nation will wake up; and people now making a precarious living in other states will get rich in the lower Colorado basin.

The Forest Primeval

We do not look upon Arizona as a State producing enough lumber to talk about. We used to say in the old days in Southern Arizona that when the Lord made the rivers in Arizona he made them upside down, the bed of the river being on top, and the water under it; that we had to dig down for water, and if we wanted wood for fuel we had to go under the surface and dig up mesquite roots. But those days are gone forever. In Northern Arizona, eastern and central, there are great timber belts, and Coconino, the largest county in the United States, has also the largest timber reserve in the world. It is said that there are thirty-one lumber mills in Arizona, producing about 160,000,000 board-feet of lumber a year, which has a market value of nearly $5,000,000, and employs more than 2,000 people. One of the largest mills is at McNary, where the Cady Company, Louisiana people, entered about three years ago. Most of the lumber handled here is a very fine species of white pine. Government experts say that standing timber in the McNary district reaches 6,800,000,000 feet, and in the Flagstaff district 5,000,000,000 feet. And there is one good thing about the way they do it in Arizona: they have worked out carefully a reforestation program, and they expect to have saw lumber always.

The Three C's

The three C's, Copper, Cattle, and Cotton, help to make this an alluring State. America leads the world in the production of copper, and Arizona leads all other States in the Union. In 1926 they produced over 725,000,000 pounds of copper. The copper men spent $10,000,000 in the State installing new methods of mining, and so decreased the

cost of handling ores that they increased the potential wealth of Arizona at about a million dollars. The richest mine in the richest copper-production section of the world is the Inspiration Consolidated Copper Company at Miami. This is valued at $36,979,000. The Copper Queen branch of the Phelps-Dodge Corporation in Cochise County is second, with a value of mines and smelters of $35,290,000. The United Verde Copper Company of Yavapai County, of which Prescott is the county seat, is $25,732,627; with the United Verde Extension Mining Company of the same county with property valued at $20,030,887. The Ray Consolidated Copper Company of Pinal County, $20,532,003; Calumet and Arizona Mining Company of Cochise County, $20,390,244; the New Cornelia Copper Company at Ajo, $20,801,119; the Phelps-Dodge Corporation, the Morenci Branch, $12,010,677; the Old Dominion Copper Company at Globe, $6,344,410; the Magma Copper Company at Superior, $8,341,210; the Miami Copper Company, $9,831,745. There are 21 copper companies in the State, and they represent a total valuation of $207,305,144. Copper is the rock bottom foundation upon which many great towns in the State are bu ilt, like Clifton, Morenci, Ajo, Douglas, Bisbee, Jerome, Clarksdale, recalling visions of Senator Clark, and Ray.

Cattle. In the old days Arizona was nothing but a range, and not always a good range at that. Now cattle are brought into the State in the winter time to fatten for the Eastern market. According to the United States Bureau of Markets for 1925 there were over a million range and beef cattle within the State. The cattle industry in Arizona is worth $8,500,000. When you consider that Arizona produces a larger alfalfa tonnage than any other State in the Union, and a superior brand at that, getting more per ton and per acre, you do not wonder that the dairy industry flourishes, and keeps the lucky possessor of the lowly kine supplied with ready money. There are considerably over a million sheep, and the owners ship more than 6,000,000 pounds of wool annually.

Cotton. About one-third of the cotton acreage in Maricopa County is devoted to long-staple cotton, the kind that

we thought we had to go to Egypt to get years ago. In the 125,000 acres put out to cotton in this county in 1925 there was a valuation of nearly $10,000,000 placed on it. Other sections of the State grow a superior brand of cotton. It is so good in Pima County that "Pima cotton" has passed into the language.

Arizona, an Agricultural Arcadia

We do not want you to think that the Salt River Valley is the only fertile spot in Arizona. The Gila Valley all around Safford and near Miami and Globe, the Verde Valley, and most of the country around Prescott are just as fertile. So is the country around Tucson and Nogales and Bowie, and there are valleys around Flagstaff and Wilcox that are agricultural surprises. All of the land that borders on the Colorado River is as fertile as any of the river-bottom land in the Mississippi Valley (where I was born), and for the same reason: it is alluvial, being built up through the ages by rich deposits.

The Laguna Diversion dam on the Colorado River above Yuma has a span of 4,470 feet. It was built in 1909 at a cost of $2,000,000, and so well built that for seventeen years the flood waters of the Colorado have not make the slightest impression on its stony face. Water for irrigation purposes was turned into the siphon on June 29, 1912. The dam is a concrete structure resting on piles driven from forty to sixty feet through a bed of quicksand, which remarkable piece of work makes it an engineering marvel. There are 65,000 acres under irrigation, making the Yuma Project the second largest in the State. It is capable of watering 150,000 acres. This dam will some day be supplemented to furnish electrical energy and most of the water needed in that region for irrigation. Yuma County ranks second in the value of agricultural products in Arizona. At Parker, which is also on the Colorado River, and on the Santa Fe direct line from Los Angeles to Phœnix, there are several thousand acres under cultivation.

There are a few other irrigation projects we want to mention. First Lake Pleasant dam, across the Agua Fria River, thirty-five miles northwest of Phœnix. Work is

being rushed on this dam, and it will be completed in October, 1927. It will cost $3,500,000. The lake will have a storage capacity of 173,500 acre-feet, the dam will rise 171 feet above the bed of the stream. This will water the Beardsley Tract, one of the finest plots of undeveloped ground in Arizona, practically free from frost, and adapted to citrus growing.

The Gillespie dam, on the Gila River southwest of Phœnix, waters more than 80,000 acres of fertile land.

Time would fail us to tell of all the resources of this treasure State. We could write a book on this subject alone—and if we are not careful we'll do it—so we will slam on the emergency brake. But there are a few things which will come to you in the nature of a surprise that we want to speak of, and then rest our case for the use of our title, "Alluring Arizona," without further argument. We stated that Arizona is first in copper production. This is true, yet you would hardly think of it as producing gold and silver, but it does in a surprising way, for it is third in gold production, fourth in silver, and sixth in lead—this for the United States. In 1926 it produced 19,000,000 pounds of lead, 182,000 ounces of gold, and 6,175,000 ounces of silver. In 1925 it had a total value for all metals of more than $114,000,000. Its nearest competitor was Utah with $82,000,000, and then Montana with a little over $60,000,000; while California, the "Golden State," had less than $23,000,000.

Winter vegetables are a gold mine. They begin shipping in the early part of December, and the returns vary from four hundred to twelve hundred dollars an acre—cauliflower leading with a value of from eight to twelve hundred dollars an acre. Peoria, Glendale, Litchfield, Buckeye, are all as fertile as the Garden of the Lord as thou comest unto Zoar.

Citrus fruit is a golden crop. Grapefruit and oranges are planted on about 2500 acres, mostly in the Salt River Valley, and bring in a million dollars a year. Around Scottsdale, and right against picturesque Camelback Mountain, they raise some of the finest grapefruit and oranges you

ever tasted. It is said that fully seventy-five per cent of the grapefruit raised in Arizona is sold in California, and other Pacific Coast States. They even raise dates in the Salt River Valley; and if you like an Oriental setting you can get it here. There is one thing you will miss, however, and that is the flies that gather in and around an Arabian date harvest. A returned traveler from Mesopotamia said that if the American people could see the way some Arabs pack dates, mainly by "stepping on it" with bare feet, which could stand considerable bathing and manicuring—or pedicuring—they would have to have a cast-iron stomach to get an Arabian date down past the first row of rings in their esophagus. Everything is sanitary in the date business in Arizona, and a really superior brand of date is raised. The average income from the dates grown in the valley is $980 an acre.

No wonder there has been 125 per cent increase in population since 1910.

The Things That Make Life Worth Living

Don't imagine that all of the prosperity in Arizona is material. They have the things we cannot do without, no matter how fertile the soil or fat the bank account. Like all the rest of the West, Arizona is strong for good schools—only stronger. They rank third in the United States, and from the standpoint of up-to-date architecture, equipment, and literary standards they are second to none. The University of Arizona is A 1. They have a fine normal college at Tempe, and another at Flagstaff. They have buildings for the grammar grades in Phœnix and Tucson which would have been the admiration of many a college in the East in the old days. They are well equipped to teach from the standpoint of physical equipment; they hire good teachers and pay them good salaries, a whole lot more than in some of the Eastern States.

They have plenty of churches in Arizona, and from the way they are putting up new buildings they are keeping step with the material progress of the State.

They have good roads. Every section of the State is

connected, and the good work still goes on. The State system has nearly 2,018 miles, and they are still building. When you consider that this State is one of the youngest in the Union, and that it is fifth in size, having some counties larger than some entire New England States—Vermont or New Hampshire, for instance—and goes from sea level to nearly 8,000 feet, skirting for miles strong and high mountains, whose sides have to be blasted to make a road, you begin to marvel at what has been done. Some sections of the State have not yet been paved, but they have all the ingredients of a perfectly good road at hand: concrete, granite, and hard-surfacing materials, and all they ask is that you give them half a chance to get to it.

There is no place like home—whether you find it in Alabama or Arizona. Being a new country, the homes here are new, modern; and in the cities up to the minute, with all the modern conveniences and that which makes for comfort, even luxury. In Phœnix and Tucson especially some of the most beautiful homes in the country are being built.

Hail, and Farewell

We must end somewhere, as much as we hate to do it, for there is a whole lot more we would like to say, but space has its limitations. However, we cannot bring this book to a close without paying a tribute to the men and women who made Arizona. There is an organization of pioneers in Arizona called the Hassayampa Club. They take their name from the Hassayampa River, which runs near Prescott, and it is said that anyone who drinks the waters of this river will never tell the truth again, save a dollar, or leave the State of Arizona. If you don't believe it, you are at liberty to try it. We are at least willing to vouch for the last statement: they never leave Arizona. These men and women were pioneers in all the moods and tenses of that word. They were Pioneers, and then some. They came to Arizona when the Apache was running aces wild. He'd just as soon scalp you as look at you—in fact, he'd much rather. But these pioneers were the kind of

stuff out of which heroes were made; the very sort of people on which the American Union was built. They held the plow with one hand and the rifle with the other, and kept both eyes open for Apaches and other hostile enemies. They fought wild beasts, all kinds of varmints and reptiles; they blistered under the blazing sun; they built up irrigation systems, and pulled a reluctant living out of the hard earth of the desert. They had ten thousand discouragements, mighty few creature comforts, and yet they went on. And while they dwelt in tents or in wind-swept adobes they had that vision which saw in the distance cities with sure foundations. They builded better than they knew. In what heroic mold these men were cast. And the women—those brave, patient, pioneer mothers! They shared all the hardships and faced all the dangers of the men; and like good, strong women everywhere they had added responsibilities, for on them daily was the care of the home and all the children, those fortunate and bright-visioned men and women of Arizona to-day who are following in the footsteps of such fine parents, and who are building this State. These heroic mothers believed all things, hoped all things, endured all things. They had the courage, the faith, the love that faints not, neither grows weary. And so, as it was said of some great Romans, so may it be said of these heroic men and women, "They deserve well of the State." In humble reverence and admiration to these noblest Romans of them all, the pioneers, my hat is off, "I salute you."

FINIS